First Copy

A National Newspaper for Every Branch of the Industry

Automotive Daily News

CARS · SHOP EQUIPMENT · TRUCKS · AVIATION · PARTS · ACCESSORIES · TIRES

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CHRYSLER ADDS DE LUXE LINE TO '8'

Col. Ayres Predicts Greater Era of Prosperity in Future; Depression Bottom Reached

Says Question Is No Longer That of Depth of Depression, but Rather That of Its Probable Duration

CLEVELAND, May 14.—From a renewed study of business cycles Col. Leonard P. Ayres, vice-president of the Cleveland Trust Company, finds confidence for the belief that in the future will come years of even greater prosperity than any we have yet experienced.

So far as the near term outlook is concerned, however, Colonel Ayers, who is one of the country's foremost business forecasters, ventures only to suggest that the reaching of the bottom of this depression already has become a matter of history and that the crucial question is no longer that of its depth, but rather that of its probable duration.

Included in the bank's current business bulletin is a long desk-sheet diagram showing the business cycles of American industry for the past 78 years, representing a piece of statistical research carrying rec-

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APRIL CONSUMPTION OF CRUDE RUBBER HIGHEST SINCE JUNE

New York, May 14.—Consumption of crude rubber by manufacturers in the United States for the month of April was the highest for any month since June, 1930, and is estimated to be 33,321 long tons, an increase of 1.6 per cent. over the March consumption of 32,788 long tons, according to statistics compiled by the Rubber Manufacturers Association.

Imports of crude rubber for April amounted to 46,648 long tons, as compared with 40,338 long tons for March and 49,927 long tons for April, 1930.

The association estimates total domestic stocks of crude rubber on hand and in transit overland on April 30 at 228,382 long tons, an increase of 4.9 per cent. over March and 54 per cent. over April, 1930.

Crude rubber afloat for United States ports on April 30 is estimated at 56,700 long tons, as against 63,133 long tons on March 31 and 63,261 long tons on April 30 a year ago.

APRIL TRUCK SALES PUT AT 33,500 UNITS

Estimate Reached From Registrations in 12 States and D. C.

NEW YORK, May 14.—Registration returns from twelve states and the District of Columbia indicate that retail sales of new commercial cars in the United States in April approximated 33,500. This is the estimate of Automotive Daily News after a close study of the returns at hand.

This estimated total for April compares with approximately 30,000 in March and represents a seasonal upturn of 11.5 per cent. and, with 46,977 in April, 1930, a decline of 28 per cent.

On the basis of this estimate new

(Continued on Page 5)

FREE WHEELING OPTIONAL IN HUDSON-ESSEX MODELS

DETROIT, May 14.—Selective free wheeling will be offered on all Hudson and Essex models as optional equipment, commencing Monday, May 18, according to an announcement by William J. McAneeny, president and general manager of the Hudson Motor Car Company.

The adoption of free wheeling by Hudson makes Essex the lowest priced car offering this new but now established feature, with Hudson maintaining its position as the lowest priced eight, Mr. McAneeny points out.

While all of the basic principles of free wheeling as used in the costliest cars are retained in every detail of the selective mechanism, Hudson engineers have included

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Five New Bodies Include Features Formerly Used Only in Imperial Types

Prices Range $1,525 to $1,970; Chassis and Engine Changes Add Greater Strength and Power

DETROIT, May 14.—Five de luxe body styles, patterned after the Chrysler Imperial-8 in appearance, and with distinctive interior appointments, have been added to the Chrysler straight-8 line, announced today. The new models are offered at a factory price range of $1,525 for the coupe, $1,545 for the roadster, $1,565 for the sedan, $1,585 for the convertible coupe and $1,970 for the phaeton.

The engine of the de luxe models has a bore of 3¼ inches, and a stroke of 4¼ inches, and a piston displacement of 282.1 cubic inch. The S. A. E. rated horsepower is 33.8, and it develops 95 b.h.p. at 3,400 r.p.m. The standard compression ratio is 5.2 to 1, and an optional ratio of 6.2 to 1 is provided. The engine is insulated from the frame by its five point mounting on rubber.

The balanced crankshaft has eight counterweights and is supported on five main bearings which have a total area of 59.4 square inches. It weighs 87½ pounds equipped with the Chrysler impulse neutralizer.

Aluminum alloy pistons of the isotherm steel strut type with three compression rings and one oil control ring are used. Intake valves are of chrome nickel steel, and the exhaust valves of silchrome steel.

The down draft carburetor incorporates an accelerating pump. A fuel pump is used.

Full force lubrication is supplied to all main, connecting rod and camshaft bearings. The oil pump is of the gear type. Engine accessories include an oil filter, combination air cleaner and intake si-

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CHEVROLET SALES CHIEF SEES TRADE UPTURN UNDER WAY

Chicago, May 14.—H. J. Klingler, vice-president and general sales manager of the Chevrolet Motor Company, presented evidence in support of his belief that an industrial upturn is under way at a meeting of the firm's field personnel of the Great Lakes region here yesterday.

Chicago dealers reported an increase in April sales of new Chevrolets over last April, which was regarded as a normal month, and other sections of the country are beginning to show a comparable increase, Mr. Klingler said.

"The industrial slump did not hit us until late May last year," he continued. "Hence, the first four months of 1930 were regarded as normal. The fact of April sales showing an increase over last April in certain sections indicates an opening up of retail buying and bet-

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Late News Flashes

Washington, May 14.—Southwestern railroads are accorded a higher percentage of the divisions of joint rates for the transportation of petroleum and its products between origins in Oklahoma, Arkansas, Texas and the portion of Louisiana west of the Mississippi River, to destinations in Indiana, under findings of the Interstate Commerce Commission in disposing of a complaint filed by the Southwestern roads alleging inadequacy of divisions received by them on this traffic.

* * *

San Francisco, May 14.—Investment of $300,000 for new tri-motor planes, construction of new hangar depot facilities at Western cities, signing of contract with Western Union to sell tickets and reduction of Pacific Coast fares were reported by Boeing System, United Aircraft subsidiary.

* * *

Chicago, May 14.—Heavy melting steel scrap is 25 cents a ton lower, being quoted at $8.50 to $9, compared with $8.75 to $9.25 previously.

TODAY

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Oakland May Operations Exceeding April Record

PONTIAC, MICH., May 14.—With a production total of 14,188 cars for the month, April became the biggest month of the Oakland Motor Car Company since August, 1929—some twenty months ago. The April figure compares with 12,245 for March of this year and 13,763 for April of a year ago.

April retail sales this year took a spectacular jump over the March level. The April sales figure was 13,557, as compared with 9,887 for March, an increase of nearly 40 per cent.

Present operations of the company continue considerably in excess of the corresponding period of last year, and give promise of another new mark in May. This is all the more significant because ordinarily April exceeds May.

As early as May 4 the factory had on hand 13,110 orders for May shipment. Telegrams were on hand asking that delivery of 6,500 of these be rushed at once. As a result of this situation, Oakland already seems assured of passing its May, 1930, mark, when retail sales totaled 11,155 units.

Factory officials report that business is showing a decided pick-up in many sections, especially along the Atlantic Seaboard, which at this time, as far as Oakland-Pontiac is concerned, is showing a 25 per cent. gain over the corresponding period of last year.

Evidence of this is seen in the fact that a solid trainload of automobiles is leaving the factory almost every day to each of several large Eastern points, such as New York, Boston,

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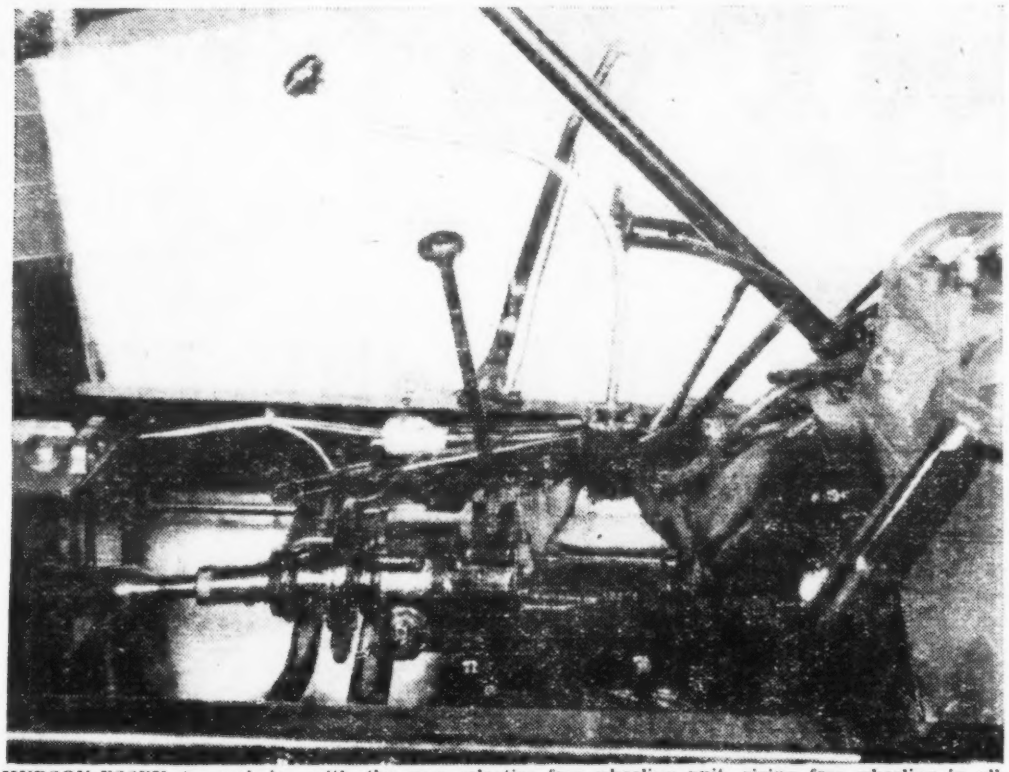
Bonus Penalty System Ends Hit or Miss Service

See Page 3

New Hudson-Essex Free Wheel Unit



HUDSON-ESSEX transmission with the new selective free wheeling unit, giving free wheeling in all forward speeds—low, intermediate, direct. The change from "positive gear" to free wheeling, or vice versa, is made through the short, straight lever in the rear of the regular gear shift lever. The Hudson-Essex gear lock, preventing accidental disengagement of transmission gears, has been made a part of the free wheeling device. Free wheeling is automatically released every time the transmission is shifted into reverse.

FREE WHEELING OPTIONAL IN HUDSON-ESSEX MODELS

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several engineering advancements and it is to these that the term "selective" has been applied. The word, says Mr. McAneeny, should be taken perfectly literally, for the driver is able to enjoy the fullest advantages of free wheeling or operate his car as a standard vehicle, whichever he desires, by simply touching a small lever.

This lever, which is placed conveniently at the driver's right hand, when moved backward puts the car "into" free wheeling for all three forward speeds, the driver merely continuing to drive as in a conventional car. He is, however, also able to "free wheel" at will, returning to any gear without any thought of touching the lever.

The Hudson and Essex interlocking gear device has been retained.

Still further simplification has been provided through the automatic action of the selective free wheeling lever should the driver omit to disengage it before trying to go into reverse. Immediately the gearshift is thrown into reverse, the free-wheeling lever slides forward, the car immediately becoming a standard car, ready to reverse or go forward at the will of the driver. A simple touch again provides free wheeling.

"We aimed at accentuating the comfort of both models," says Mr. McAneeny, "and we believe we have succeeded without in the slightest confusing the driver and with the least possible effort."

OAKLAND SPEEDS OPERATIONS TO MEET DEMAND

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Philadelphia, etc. These trains are made up of thirty railroad cars, carrying 120 automobiles with a retail value of approximately $100,000.

Proof of a pick-up in the West, too, is indicated in the fact that several times the factory has found it advisable to dispatch special trainloads to take care of extra orders that were over and above the anticipated requirements of this territory. Three of these trainloads are leaving this week, one to Denver, one to Omaha and one to Kansas City.

ELCO GREASE COMPANY ENTERS INDIANAPOLIS RACE

Cleveland, O., May 14.—The Elco Royale Special, weight 3,100 pounds, 129-inch wheel base, driven by a 358 cubic inch eight-in-line engine, developing 145 horse power, will be the entry of the Elco Grease and Oil Company, specialist in the manufacture of lead base lubricants for transmissions and axles. This entry will use the firm's Elco Gear Safety No. 28.

BURGESS-NORTON SALES IN 1930 ONLY 2% OFF

Geneva, Ill., May 14.—Net sales of the Burgess-Norton Manufacturing Company, Geneva, Ill., for 1930 were only 2 per cent. less than in 1929, the biggest year in the history of this company. After providing for obsolescence and other reserves, taxes, etc., preferred stock dividends of 7 per cent. were paid, and there remained an earned profit of $1.28 per share on the common stock.

The sales for the first four months of 1931 compare favorably with 1930, April showing the largest volume since May of last year. Regular quarterly preferred dividends of 1¾ per cent. were paid April 15.

C. M. Burgess, president says: "Both jobbers' business and production releases from engine manufactures make a twelve and twenty-four hour per day production schedule necessary six days of the week. Business conditions are gradually improving, and with the second-hand care sales on the increase, prospects for a big year in the replacement parts industry are excellent."

NEW TIRE CONCERN

Rocky Mount, N. C., May 14.—The Chapman Tire Company has been incorporated here by George B. Chapman, Bia Tyree Chapman and R. C. Tyree.

CHEVROLET SALES CHIEF SEES TRADE UPTURN UNDER WAY

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ter than normal conditions, at least so far as we are concerned.

"In April our original schedule called for the production of 85,000 cars and trucks. Increases in dealer orders during the month, however, necessitated frequent upward revisions of the schedule, with the result that actual production was 106,000 units.

"Of this total production, close to 100,000 units were required for domestic consumption. Yet while delivering this number of new cars we reduced both new and used car stocks in our dealers' hands during the month. In this region, which includes all or part of the states of Illinois, Wisconsin, Minnesota, North Dakota, Iowa and Nebraska, our dealers sold 25,000 used cars last month and reduced their stocks more than 5,000, as against May 1 last year.

"In May we should do at least as well as in April and make it rank with the best month of 1930. In June I expect this year's production and sales curve to intersect last year's, and I look for June and every succeeding month this year to exceed the corresponding month of 1930.

"The brightest spot in the country right now, from the standpoint of the business we are doing, is the area along the north Atlantic seaboard. This section was the first hit by the industrial depression following the stock market crash, and it appears to be, appropriately, the first to recover. The Pacific Coast, also, is a bright spot, and never was affected as hard as the rest of the country. I am hoping that by fall the healthy upward trend already evident along the two coasts will have blanketed the entire country."

Mr. Klingler heads the largest and highest ranking group of Chevrolet sales executives yet to hold a meeting here outside of the automobile show period. Included in his party are D. E. Ralston, assistant general sales manager; R. K. White, advertising manager; M. D. Douglas, general parts and service manager; Sidney Corbett, manager of the commercial car division; W. G. Lewellen, sales promotion manager; J. E. Johnson, manager of dealer accounting, and others. L. K. Cooper, Great Lakes regional manager, was host to the visitors.

SPARKS *from* DETROIT

Duesenberg Looks 'Em Over

* * *

A Coincidence

* * *

The First Year and a Half

* * *

Farmers Are Buying

* * *

Chris Sinsabaugh—Detroit Editor

AS Steve Hannagan calls him, the "Rockne of racing," Fred Duesenberg held the interest from start to finish of members of the Detroit section of the S. A. E. while he was giving them inside information on the mechanical features of the seventy-one cars entered in this year's 500-mile race at Indianapolis. This was the first pre-view Detroit engineers ever have had of the international sweepstakes.

No one is better qualified for this analysis than the builder of Duesenberg cars, developed from lessons Duesenberg learned from racing. This year the veteran puts an unusual slant on the subject by dividing the field into classes.

* * *

THE "new professional" class includes cars built this year especially for racing purposes. There are fourteen in this section—five sixteens, six eights, two fours and one six. The average displacement is 242.5, the average bore and stroke 2.918 and 3.336.

"Not a great deal to be learned from this class except the comparative performance of the sixteens compared with the eights," commented the speaker.

The "revamped professional" division has in it the racing cars built before the change in rules which brought back the two-seaters. To meet present conditions, these have had to be rebuilt, many of them having to carry nearly double the burden of weight required from some of their larger competitors. In this division there are twenty eights and three fours, of an average displacement of 159.7 inches and bore and stroke of 2.765 and 3.622. In this set are thirteen or fourteen Miller and six Duesenberg engines.

Duesenberg's comment: "Most of these cars have good chassis, but are seriously handicapped because two-passenger bodies have been put on the old midget frames, which has hampered streamlining seriously. It is an even break that out of this class will emerge the winner."

* * *

THEN come the hoi-polloi, the "revamped stock car class," with twenty-eight entries, three fours and the others eights, with an average of 274.5 inch displacement and 3.148 and 4.758 bore and stroke. Among these are several well-known makes, not entered by the factories and without their support, whose identities are concealed by the nomenclature adopted. These are nominated by owners eager to get a piece of the $100,000 prize money, who have prepped the cars to a racing pitch. At this time it has not been possible to positively identify their origin, but Duesenberg said that apparently there are a Hudson, two Buicks, four Studebakers, one Auburn and fourteen Duesenberg Model A's included in this outfit. "A great deal should be learned by engineers from this class," was the summing up.

* * *

COMMENTING on the field in general, the racing Rockne was disappointed in there being only six front-drives nominated, despite the fact of last year's winner being of this type. These are three or more independently sprung rear wheel cars in the race. The Cummins Diesel will be watched with interest. The Coleman eight is the largest car, with a piston displacement of 364 inches. The Cantlon Miller sixteen, a "new professional," will have more horsepower per pound weight than any other in the race. It is reported to have 300 horse power and be able to do 200 miles per hour.

* * *

AGAIN the long arm of coincidence reaches out, this time tapping on the shoulder the newly appointed assistant to the president of De Soto, John Palmer. Years ago he was secretary to Horace Dodge of Dodge Brothers, now merged with Chrysler. When he went on the new De Soto job the other day he thought the desk assigned him looked strangely familiar. It was. It was Horace Dodge's old desk, which, in the course of human events, had been shifted around by Chrysler until it reached its present location.

"Many's the time I have stood beside that desk, receiving instructions from the big boss, but I never expected to put my own feet under it and call it my office home," said Palmer, following the recognition.

* * *

LATELY enrolled as a Dodge dealer, Louis Engel, Jr., of Buffalo points with pride to the fact he has been selling

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Franklin Dealer Uses 2-Way Bonus System

New Haven, Conn., Firm Rewards for Good Jobs And Fines Mechanics for Poor Work; Also Finds Inspection Plan Successful

A BONUS and penalty system, whereby mechanics are rewarded for good jobs and fined for poor work, has proved a highly successful feature for the service department of Cowles Tolman & Sons, Inc., 758 State St., New Haven, Conn., Franklin dealership. This dealership has paid partcular attention to its service and as a result is now able to keep sixteen men employed in the department.

The bonus system provides for payment of 50 cents on every satisfactory service job, with a like penalty if the work is not right. If the job is a large one, involving much time and material, and is not handled properly, the penalty is $1. The bonus never exceeds 50 cents, however. This system has enabled the shop to effect a material reduction in the number of unsatisfactory jobs, according to Ruel Tolman, sales and service manager.

Mr. Tolman and J. K. Dowd, superintendent of the service department, have emphasized a policy of specialization on the part of the mechanics. An effort is made to have every man specialize in certain operations as much as possible. This, Mr. Tolman believes, results in greater efficiency and enables the shop to have its work finished at the stipulated time.

"Service is very nearly the most important question facing an automobile dealership today," Mr. Tolman says. "Modern service requirements are far in advance of those of a year or two years ago, and this change must be allowed for. As we service no make other than our own, we are able to carry on that end of the business with a minimum of outside influence or competition.

"We expect and get the best possible results from our workmen, who are advanced in the ranks automatically as their efficiency increases. We make sure to deliver all jobs on time and feel that when a car, whether new or used, leaves the department after the many inspections that are required under our policy of workmanship, that it will be satisfactory to the customer. Incidentally, buyers of new cars seldom fail to return for repetition of the service we give in the beginning. The bulk of our service today is on used cars."

The inspection policy to which Mr. Tolman referred is an interesting one, tying in as it does with the bonus system. Six of the mechanics are members of the so-called "inspection teams," two to a team. These men carefully inspect every car that goes out, determining whether the job is satisfactory and that all is in readiness for the customer.

Mr. Dowd, the service superintendent, is on the job as soon as a car enters the shop and goes about diagnosing the trouble with tests, both outside and inside the building. He supervises all important operations and is the "general factotum" on the mechanical end.

The regular ninety-day guarantee on workmanship, with inspection and greasing at 1,000 mile intervals, is in force on new cars. When the 3,000-mile point is reached, there is a general adjustment, lubrication, thorough cleaning and tightening up, washing motor and testing the car for rattles and squeaks.

A sliding scale is in effect on used cars. One complete inspection and check-up is given on cars sold for under $500, while those in the $500-$1,000 class get two complete inspections. Cars sold for $1,000 and over receive the same service as that given on new cars.

The sliding scale plan has proved very satisfactory, according to Mr. Tolman. The following points are covered in the monthly inspections: Oiling, greasing, washing motor, cleaning and adjusting spark plugs, adjusting valves and ignition points, timing chain, generator output, tightening spring clips, checking battery terminals, aligning front wheels, checking tires and road test.

DEALER DOINGS

TOWER-CONNOLLY MOTORS NAMED CHRYSLER DEALER

Newark, N. J., May 14.—Alfred De Cozen, president and general manager of the De Cozen Motor Company, New Jersey distributor of Chrysler cars, announces the appointment of Tower-Connolly Motors, Inc., authorized Chrysler dealer in Elizabeth. Henry A. Connolly is president of the new corporation, and L. Ralston Tower is secretary-treasurer. Extensive alterations have been made to the building at West Jersey and Cherry Streets. The service portion of the building occupies 10,000 feet of floor space. There will be a complete parts department.

IN LARGER QUARTERS

Tacoma, Wash., May 14.—Walter O. McLaughlin, South Tacoma Hudson-Essex dealer, has moved the McLaughlin Motor Company to larger quarters at 5634 Union Ave. He has appointed W. W. Robbins as sales manager.

G. A. POUND PROMOTED

Tacoma, Wash., May 14.—G. A. Pound, who recently joined the staff of the Allen Motor Company, Southwest Washington Studebaker distributor, to assume charge of motor truck sales, has been promoted to the position of sales manager in charge of both truck and automobile sales, according to Harold Allen, president of the Tacoma concern.

OPENS NASH DEALERSHIP

Buffalo, May 14.—Harry M. Damon, automobile dealer here since 1907, has established a Nash sales and service business at 1556 Hertel Ave., Buffalo.

TAKES ON PIERCE-ARROW

Lansing, Mich., May 14.—The F. H. McClintock Company, Auburn dealer in the Lansing area, is now also dealer for Pierce-Arrow here, according to announcement by F. H. McClintock, president of the concern.

NEW DURANT DEALER

West New York, N. J., May 14.—The West Shore Marmon Corporation, 4732-34 Hudson Boulevard, here, has been appointed Durant dealer, in addition to the present line of Marmon cars.

E. G. JAMESON NAMED

Madison, Wis., May 14.—E. G. Jameson has been named sales manager of the Whippet-Knight Sales Company here, succeeding Paul O. Larson, who has accepted a new position in the sales department of the Studebaker Corporation at South Bend, Ind. O. D. Smart is general manager of the local agency.

CELEBRATES ANNIVERSARY

Newark, N. J., May 14.—Joe Rath, used car manager of G. W. Tisdale Inc., Hupmobile distributor, celebrated his tenth anniversary as used car manager for Tisdale this week. Mr. Rath is known in Newark as an authority on the merchandising of used cars, and he has computed that, since he has been with Tisdale, he has sold more than 10,000 of them.

BONNELL-MASON ADOPTS NATIONAL SERVICE PLAN

Newark, N. J., May 14.—Building owner good will through outstanding dealer service represents the latest objective of Oakland's executive group. In conformity with the national plan Edward B. Mason, vice-president of the Bonnell-Mason Company, distributor of Oakland-Pontiac, announces that the service department has been placed in charge of Edwin Smethy, with Robert J. Rogers as assistant. The new development involves two major activities. First, the company is establishing complete and conveniently available stocks of factory service parts. Second, it is assuring a complete course of service instruction for every Oakland-Pontiac mechanic.

How Portland, Ore., Dealers Increased Their Service

PORTLAND, Ore., May 14.—Portland dealers and service superintendents report that April business was slightly improved over March as far as service was concerned, but that work is not coming in as well as it did during the corresponding period of last year.

Packard Sales and Service, however, reported that business was about 9 per cent. better than in April of 1930. The first half of April brought about fifty more productive hours than during the same part of March this year. For two years, Lee Merrill, service manager of this company, has had a special representative out selling service to Packard owners. This service salesman's calls are followed up by direct mail. This method has brought in more business than anything else ever tried. Mr. Merrill believes that with the coming of fine weather business in the service department will further increase.

The Portland De Vaux Motor Company, Durant and De Vaux distributor, report service for April about 15 or 20 per cent. ahead of March, but somewhat less than during the corresponding period of 1930. This company relies mostly on direct mail for building business in the service department. Mr. Sherwood, service superintendent, stated that a recent solicitation sent to 1,000 names brought a response from 15 per cent., and that a more complete list of 2,000 is now being used even more successfully.

H. H. Lasquie, service manager of the W. W. Shipley Company, is also a strong believer in direct mail, particularly on advertising specials, which bring ready response. April saw a slight increase in business, but business is a little slow, says Lasquie.

Mr. Buckley, service manager of Grimm, Schneider and Bacon, Hudson-Essex distributors, stated that he anticipated a 30 per cent. increase in the service department during the next few months over the past two. Car owners have been putting off buying new cars, and even fixing up the ones they have, he said, and now that vacation time is arriving, the service department should be filled.

"Send people out smiling—it is the best advertisement for the department," said Mr. Buckley. "Cutting prices does no good. If you please your present customers, they will tell others. All our men are experienced mechanics, even the man we have greasing cars. I have no shop foreman nor any tester and do not need them, for every one of my twelve mechanics knows that they must turn out the right kind of a job."

Car Sales in South Carolina Climb; April Tops Year Ago

NEW YORK, May 14. — South Carolina, the first state of the South to report new passenger car registrations for April, established an increase over April, 1930, and continued to show the improvement that suddenly appeared in March.

South Carolina registrations last month amounted to 1,746, as compared with 1,677 a year ago, a gain of 4 per cent., and comparing with 1,300 in March, a seasonal upturn of 34 per cent.

The new car sales record in South Carolina thus far this year has been one of constant improvement in comparison with 1930. The state started the year with a falling off in sales of 66 per cent., somewhat alarming. The decline was cut to 32 per cent. in February, and in March was only 7 per cent. The April gain over last year holds still further encouragement.

Here is the record:

	1931	1930
January	1,012	2,956
February	959	1,416
March	1,300	1,398
April	1,746	1,677
Totals	5,017	7,447

For the first four months of the year, registrations of new cars in South Carolina amounted to 5,017, as compared with 7,447 in the corresponding period of last year, a decline of 32 per cent.

Sales of Auburn, Cadillac, Chevrolet, Chrysler, Cord, De Soto, Dodge, Essex, Hupmobile, Oldsmobile, Pierce-Arrow, Pontiac, Studebaker and Willys cars in April exceeded a year ago, and gains in the four-month period over last year were set up by Auburn, Cadillac, Cord, Pierce-Arrow and Viking.

Following are April, 1931, sales, as compared with a year ago and with March::

	April 1931	April 1930	March 1931
Auburn	1	..	1
Austin	3	*	10
Buick	46	50	36
Cadillac	3	1	1
Chevrolet	735	536	528
Chrysler	38	37	31
Cord	2	..	..
De Soto	38	23	15
Dodge	43	39	23
Durant	..	2	1
Essex	25	19	10
Ford	642	779	548
Franklin	..	1	2
Graham	3	7	3
Hudson	8	17	9
Hupmobile	16	9	7
La Salle	2	3	..
Lincoln	..	1	1
Marmon	..	8	..
Nash	6	10	7
Oakland	7	10	3
Oldsmobile	18	15	17
Packard	3	9	1
Peerless	..	..	..
Pierce-Arrow	1	..	..
Plymouth	21	26	8
Pontiac	49	42	27
Reo	2	2	3
Studebaker	19	18	5
Stutz	..	..	..
Viking	..	1	..
Whippet	..	5	..
Willys	9	6	3
Willys-Kt.	1	1	..
Miscellaneous	..	..	..
Totals	1,745	1,677	1,300

*Not on the market at that time.

Here are the comparative sales for the first four months of 1931 and 1930:

	1931	1930
Auburn	3	..
Austin	27	*
Buick	126	194
Cadillac	6	4
Chevrolet	2,153	2,395
Chrysler	91	127
Cord	2	..
De Soto	71	209
Dodge	107	131
Durant	1	13
Essex	73	122
Ford	1,370	3,624
Franklin	3	8
Graham	9	27
Hudson	41	69
Hupmobile	43	47
La Salle	5	14
Lincoln	2	4
Marmon	2	32
Nash	23	58
Oakland	16	44
Oldsmobile	57	67
Packard	7	25
Peerless	..	..
Pierce-Arrow	3	1
Plymouth	56	120
Pontiac	121	156
Reo	9	17
Studebaker	48	67
Stutz	..	..
Viking	3	2
Whippet	1	36
Willys	17	23
Willys-Knight	1	4
Miscellaneous	..	1
Totals	5,017	7,447

*Not on the market at that time.

TELEPHONE CANVASS BROUGHT BEST RESULTS FOR SEATTLE DEALER

BEST results in the sale of new cars were obtained by a telephone canvass during the past few months. This is the report of August Johnson, general manager of Transport Corporation, Willys-Overland dealer and distributor in Seattle and Spokane, Wash.

"We put a special man on our payroll as a telephone salesman," declared Johnson. "He was busy on the phone during the entire eight hours of the day, and called up names as they appeared in the telephone directory, going right down the line of residence numbers. Many good prospects and good sales followed through this canvass.

"This man would first state that he was with our company and that he was making a canvass of car owners in the city. Then he would ask if the person he was talking to had a car, if satisfied with it and what the make was. If change is desired, he would then tell what our company has to offer.

"In this way he found many who wanted to make a change. In nine cases out of ten, when the lady of the house answered the phone, she would tell the story very freely as to the home car situation, and especially if not satisfied with the car owned at that time. Leads thus obtained we followed up by personal calls."

Psychological Tests For Drivers One Topic For Eastern Session

Trenton, May 14.—Motorists seeking driving licenses in New Jersey some day may be asked to "put the dot in the circle, but not in the triangle," as well as answer a hundred questions ranging from "Who is President?" to "What day of the week is it?"

Psychological tests for drivers are being given in Connecticut, and it is planned to have a discussion of them at the annual convention of the Eastern conference of motor vehicle administrators in Trenton, May 21, 22 and 23.

Harold G. Hoffman, state commissioner of motor vehicles, said arrangements were being made for Robbins Stockel, motor vehicle commissioner of Connecticut, to read a paper on the results of the tests. Hoffman said he did not favor the tests as they were being given now, but that some time a variation of them might be made use of in New Jersey.

Hoffman observed an absent-minded professor might be able to dispose of a psychological test without difficulty, but prove to be totally incompetent as an automobile driver.

Arrangements for the program of the conference are being made by the secretary, J. S. Bickell, registrar of motor vehicles of the province of Ontario. Eighteen states and two Canadian provinces will send delegates. Hofman is in charge of entertainment.

Among the subjects to be discussed is "free wheeling." Hoffman said the conference would probably express opposition to "100 per cent. free wheeling" and similar devices on cars which were believed to impair safe operation. "Free wheeling" permits a car to roll freely with clutch engaged. The engine, although "idling," does not retard it. Shifting of gears is facilitated. Modifications of the device which permit instant engagement of the engine when needed as a brake are not objected to, Hoffman explained.

Other matters on the program are interstate commercial vehicle reciprocity and further advancement of uniform motor vehicle regulations.

In addition to the business program, social events include a dinner given by the Trenton Automobile Dealers' Association at the Trenton Country Club, a yachting trip to Philadelphia, where entertainment will be provided by the Keystone Automobile Club, and a trip to Atlantic City on the last day, with the Motor Club of New Jersey acting as host.

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Of, By and For the Entire Automotive Industry"

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Is It Vulgar?

IT remained for the heir apparent to the throne of Great Britain to read his countrymen a lesson on the role that advertising plays in modern business and to take American publicity methods as the text of his sermon. From any other than the Prince of Wales British business men would probably have resented the accusation of failure properly to promote the sale of their wares.

Speaking at Manchester the other evening, the Prince of Wales gave a British industrial audience the benefit of his keen observation brought to bear during his tour of South America and parts adjacent. Of very real interest to all Americans were the Prince's remarks regarding British neglect of advertising. In part, he said:

"I am sorry to say that as a nation we are behind in regard to advertising. . . . Our foreign competitors advertise a great deal and the foremost among them are our friends in North America.

"I have heard a great many Englishmen say that the American way of 'boosting' goods, the American form of publicity, is very vulgar. This is entirely a matter of opinion, but the fact remains that our friends in the United States get away with it. If we wish to push our goods better, we must take a leaf out of their book."

The Prince then proceeded to tell his audience of how deeply American trade has penetrated the South American countries; of how the South American business man rides to his office in an American car, calls his friends on an American telephone instrument, goes to see a "cinema" produced in Hollywood and proceeds homeward over streets illuminated by American electric lights.

To a good many of us this praise from the highest source in the social scale of one of our most energetic and skillful competitors in the export market will come as somewhat of a surprise. We have somewhat tended to deprecate the work that our manufacturers have done abroad. It has frequently been said that American exporters are infants compared with those of England and Germany and, to an extent, with those of France. Evidently, whatever failings may be imputed to us on the score of understanding of export merchandising problems, we have carried our flair for advertising abroad with us, and to some purpose.

We may perhaps be pardoned for resenting the reference to the "vulgarity" of our advertising methods, even though the Prince of Wales tells his countrymen that they must imitate that characteristic of our publicizing activities. It is our idea that vulgarity, in the sense of blatancy, which is evidently what he intended, defeats its own purpose.

Advertising, to be effective, must first have a solid foundation in the actual worth of the products presented. Blatant advertising may lift sales of an inferior product temporarily, but the lack of value in the goods presented will eventually nullify the superficial publicizing.

Further, we doubt that products of excellent quality are advantaged by batancy and vulgarity in advertising them. Advertising must have attention-arresting qualities. It must have continuity (that is, iteration and reiteration) to drive home to the public mind the points it makes for its product. But American advertising is yearly getting further and further away from the blatant use of silly superlatives, of extravagant claims and fantastic assertions.

One of the most convincing advertising campaigns that we remember was one sponsored by an automobile manufacturer trying to interest dealers in taking on its lines. The motif of the copy was that this manufacturer had a very attractive proposition to offer any dealer, but that its advice to any merchant contemplating taking on the line was to consult his banker, present the whole matter to him and ask his counsel as to whether it was advisable for him to make a change under the circumstances existing. Any sensible dealer's reaction to this advertising must have been that here was a manufacturer absolutely sure of his product and his proposition, who wanted dealers only when the connection would be to the mutual advantage of both contracting parties.

Col. Ayres Predicts Greater Era of Prosperity in Future

(Continued from Page 1)

ords back nearly 25 years further than does any previous work in this field. The diagram shows that by far the longest depression in American history was that of the 70's, which lasted for nearly six years.

Colonel Ayeres in this bulletin revises previous estimates that automobile production for 1931 would show a moderate gain over that for 1930, by saying "It now appears unlikely that automobile output in 1931 will be even as large as in 1930."

Industrial production, as measured by the Federal Reserve Board's index, rose to 126 in June, 1929, and then started on the long decline that carried it down to 82 by last December. That was a fall of 35 per cent. Since last December industrial production has been increasing, and by March the index had advanced 6 points to 88.

"It seems quite unlikely that it will return to its December low point," says Col. Ayres, "and we are probably justified in concluding that business has reached the bottom of the depression, and is now bumping along there."

Speaking of the general business outlook Col. Ayres says:

"Many of the readjustments that are prerequisites to recovery have been completed, and others are under way, but little progress has so far been made toward solving some of our most difficult fundamental problems. One of these is how to maintain high industrial wages in a country in which agricultural incomes are sharply curtailed, and in a world in the rest of which the prices of industrial products have dropped and the wages of industrial workers have declined.

"A second problem is how to continue to receive payments on our foreign loans and investments while decreasing our imports and restricting our foreign lending.

"A third problem is how to conserve the values of the many billions of dollars worth of railroad securities on which our insurance companies and mutual thrift institutions largely depend, when the traffic rates permitted by Federal regulation are insufficient to meet the operating costs and fixed charges of many of the roads.

"Many roads are not covering fixed charges," says the Cleveland banker. "This condition, if long continued, will endanger rail bonds, on which life insurance funds and savings accumulations largely depend.

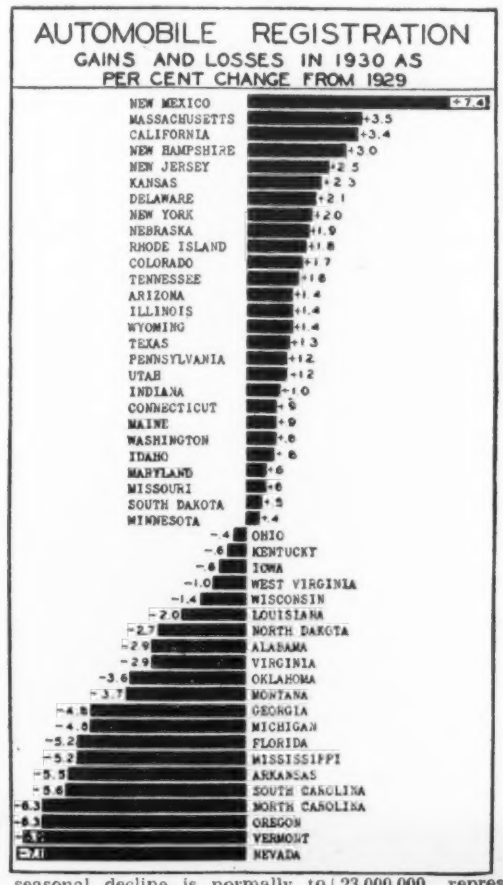
"Since the roads are now coming to a degree detrimental to their properties it would appear that relief can be had either through large tax reductions, severe wage cuts, or an increase in freight rates.

"A small rate increase would insure safety, and of the three alternatives would be the most economically sound."

For the first time in this depression the earnings of the steel industry have reached the low levels of 1921, it is pointed out. The comparative showing is not bad, however, says Col. Ayres, especially since the composite price of steel products is now some 25 per cent. lower than it was in 1921.

"Prospects for the steel industry during the summer months are largely dependent upon developments in general business activity. Of the more important outlets for steel, the automobile industry seems to hold out the greatest hope. Each month of this year automobile production has exceeded that of the preceding month. The steel industry anticipates an automobile production in May which will be about the same as that of April, whereas a seasonal decline is normally to be expected in May.

"The purchasing of steel by the railroads will probably proceed on a starvation basis during the months immediately ahead, while the prospects for tonnage in the construction industry do not appear bright. During April the number of active blast furnaces was reduced by three."



A study of automobile registration made by the Cleveland Trust Company shows that at the end of 1930, for the first time in history, almost as many states had recorded losses in motor registration during the year as had made gains. In the accompanying diagram the bars extending to the right of the first column of states indicate the percentages by which registrations increased in 1930, while those to the left of the lower list of states shows percentages by which registrations declined.

For the most part, states which showed losses are in the South and the Middle West. With few exceptions, they are states in which agriculture suffered severly from drought. It seems not improbable, says Col. Ayres, that the list of losing states will be extended in 1931 and 1931 automobile output may not be "even as large as it was in 1930."

Automobile registrations declined in twenty-one states during 1930 for a total of 282,000 cars and trucks and gained in twenty-seven states for a total of 299,000. The net result was a gain of about 17,000. Total registration of all motor vehicles was about 26,500,000, while that of passenger cars was slightly above, 23,000,000, representing an actual loss in passenger car registration of about 80,000 from the number registered in 1929. Thus, for the first time in history, the number of automobiles in use had declined from one year to the next.

COMING EVENTS

MAY

9-Aug. 9—Berlin, Germany. International Garage Exposition.
15-16—Detroit, Mich. Society of Automotive Engineers, nineteenth aeronautical meeting, Book-Cadillac.
27-29—New York City. National Foreign trade Council.

JUNE

8-12—Chicago, Ill. Radio Manufacturers Annual Show.
15-18—Madison, Wis. American Society of Mechanical Engineers, Oil and Gas Power meeting.
14-19—White Sulphur Springs, W. Va. Annual summer meeting, Society of Automotive Engineers.
22-26—Chicago, Ill. American Society for Testing Materials, annual meeting

SEPTEMBER

26-Oct. 2—Atlantic City, N. J. Annual meeting, American Electric Railway Association.

NOVEMBER

10-12—Chicago, Ill. Annual meeting, American Petroleum Institute, Hotel Stevens.

SPARKS *from* DETROIT

(Continued from page 2)

cars since 1906. When he was at the plant the other day he told of how he sold his first car.

While still a lad Louis had saved $1,500 and, on the advice of friends, he opened a garage. The same friends told him he should also become a dealer, but he lacked the capital. He took the Cartercar agency on consignment, which meant one car which had to be sold before another one could be stocked. The Cartercar, it will be remembered, was friction drive and sold for around $1,700. That car stood on the floor for a year and a half, without prospects nibbling. Then Engel's friends, who seemed to have been kidders, told him they would buy the car if it could climb a certain hill in the neighborhood, really the side of a mountain, which every car in town had failed to go up.

With nothing to lose, Engel tried it, his "friends" refusing to ride with him because of the apparent danger. Thanks to the friction drive, the Cartercar climbed the grade and the deal was closed.

Talking to salesmen recently, Engel told this, and then he cautioned his listeners not to be alarmed if they didn't sell a car the first week. "Remember," he said, "it took me a year and a half to sell my first automobile."

* * *

ENCOURAGING is the report from Flint that, despite the drought and the hard times, sales of new Buicks to farmers have increased more than 2 per cent. in the past year. This was found following a national occupational survey from August 1, 1930, to January 1, 1931, which took in 30,000 new Buick buyers.

The general classification of owners made by the Buick statistician shows the percentage of cars by each group as follows: Merchants and traders, 28.2 per cent.; manufacturing and mechanical industries, 13.5; professional, 13; business executives, 12; agriculture, 8.9; miscellaneous, 8.7; personal service occupations, 5.4; clerical, 3.2; transportation, 2.7; public service, 2.3; mining, 2.1.

The Key to Lower Delivery Costs

This report on costs in parcel delivery is the result of a survey conducted by the General Motors Truck Company, Pontiac, Mich. Automotive Daily News is pleased to present this entire report in serial form. Complete text of this report in pamphlet form is available at all General Motors Truck Company's dealers and distributorships.

ANY delivery executive who studies his truck operation along the lines discussed in the foregoing pages will find that it is practical and possible to eliminate a considerable percentage of lost time. But making those time savings pay profits in his delivery department means he must take two more steps in sound planning and management:

1. Time saved by eliminating delays on the job and idle time in the shop should be concentrated in as few trucks as possible.

2. When lost time has been concentrated in as few trucks as possible, all idle trucks not absolutely needed should be eliminated.

Let us see what these two steps involve and how they can be carried out.

Keep the Minimum Equipment at Work

When a careful analysis has been made and every effort has been expended to eliminate truck delays and idle time in the shop, the average store will find that the trucks accomplish their work and complete their routes much more quickly and effectively. That means that the trucks will return from routes earlier. But rather than have all trucks return from routes early and stand idle at the store during working hours, routes should be so revised that a smaller number of trucks are kept busy throughout the day. In that way extra time will be concentrated in relatively few trucks, which will then stand idle.

For example, a store in a Western city, which operated eleven trucks, found that by careful study and adjustment they could save six and one-half minutes out of every working hour, for each of the eleven trucks. The accompanying chart shows clearly what that meant in terms of time saved in a nine-hour day. In larger fleets, such time savings mount up to startling proportions.

A shift of this sort, of course, may seem to be a minor saving, since the extra truck stands idle. But, when eleven trucks are covering routes which might easily be covered by ten trucks, the fleet is duplicating mileage, no one truck is working at its maximum capacity, and the cost of delivery goes up. Essentially the same thing is true, of course, when a full fleet is kept at work during dull periods. No one truck is doing its maximum work, and costs go up. That is why most capable operators break down each delivery zone into small sections which can easily be transferred from one zone to the other. With such a system of zoning, routes can easily be adjusted day by day during dull periods to provide full work for a minimum number of trucks, so that others can be laid off.

Watch Excess Capacity Closely

Consistent effort to save time and concentrate all delivery into a minimum number of trucks will, over a period of time, reveal to the delivery executive the fact that he has more excess trucks standing idle in his garage than he needs. And it is in eliminating excess trucks and truck tonnage that the greatest savings can be made in the delivery department. Each truck eliminated from the fleet, without loss of efficient service, means an increase in delivery profits and a decrease in delivery costs.

Time saved, in parcel truck operation, is money saved for the store.

(TO BE CONTINUED)

CONCENTRATE TIME SAVED

One store saved an average of 6½ minutes out of each hour in a nine-hour day, or 58½ minutes for each truck.

They operated eleven trucks, so that the total time saved was 643½ minutes, or 10 hours and 43½ minutes.

So they revised routes to give ten trucks more work, and kept the eleventh truck for emergencies only.

ST. PAUL DEALERS ELECT OFFICERS

St. Paul, Minn., May 14.—The St. Paul Automobile Dealers' Association held its annual meeting last week at the St. Paul Athletic Club, at which time the following dealers were elected to office:

H. E. Warren of Warren-Given, Inc., president during the past year, was again elected to that office. C. W. Norton of Bingham & Norton, Inc., was re-elected vice-president. J. R. Rihm of Owens Motor Sales, Inc., was elected secretary and treasurer. O. N. Bonney of Bonney-Nash Motors, Inc.; C. P. Joy of Joy Brothers Motor Car Company, and A. K. McDonald of McDonald Chevrolet Company were chosen as directors. W. A. Peterson is executive secretary.

ESTIMATE APRIL SALES OF TRUCKS AT 33,500

(Continued from Page 1)

commercial car registrations in the first four months of this year totaled 111,050, as compared with 151,305 in the corresponding period of last year, a decline of 26 per cent.

Returns from the reporting states for April show a total of 6,485, as against 5,806 in the preceding month, a gain of 11.7 per cent., and comparing with 8,463 in April, 1930, a falling off of 23.3 per cent. These states reported 21,717 sales for the first four months, as compared with 27,907 a year ago, off 21 per cent.

The April estimate indicates that the falling off in that month from last year was about the same as the decline in March and slightly less than the February loss.

Here are the estimated monthly totals for 1931, as compared with 1930, with the rate of decline:

	1931	1930	% Decline
January	*24,600	30,274	18
February	*23,450	31,846	29
March	*30,000	42,188	28
April	*33,500	46,977	28
Totals	*111,050	151,305	26

*Estimated.

April sales are certain to be the best for any month since last October and may possibly equal or exceed that month, in which case April would be the best month since May of last year.

New commercial car sales are, from month to month, much more erratic than passenger car sales, as the accompanying tabulation of registrations during 1929, 1930 and 1931 shows. In 1930, for instance, trucks started the year by exceeding in sales the corresponding period of the boom year 1929 and held very high during the first quarter of the year. This year in January, the decline from a year ago was only 18 per cent., but in the very next month the falling off was 29 per cent.

Following is a table showing the month-by-month new commercial car registrations since January, 1929:

	1931	1930	1929
January	*24,600	30,274	29,857
February	*23,450	31,846	32,561
March	*30,000	42,188	46,349
April	*33,500	46,997	56,265
May	....	43,204	52,851
June	....	33,515	45,061
July	....	39,877	57,945
August	....	33,809	52,523
September	....	33,902	46,574
October	....	34,224	49,884
November	....	21,998	33,626
December	....	18,654	23,272

*Estimated.

Following are the new truck registrations in the reporting states for April, as compared with the corresponding month of last year and March, 1931:

	April 1931	April 1930	March 1931
Delaware	133	145	103
Florida	428	392	381
Illinois	1,775	2,113	1,502
Minnesota	1,060	1,659	1,230
Montana	210	221	209
No. Dakota	254	373	138
Rhode Isl.	219	261	195
So. Carolina	365	330	243
So. Dakota	198	253	177
Utah	201	271	245
W. Virginia	444	586	248
Wisconsin	945	1,723	973
Dist. of Col.	253	136	157
Totals	6,485	8,463	5,806

Here are the totals for the states for the first four months of this year and last:

	1931	1930
Delaware	370	449
Florida	2,130	2,420
Illinois	6,721	9,067
Minnesota	3,086	3,519
Montana	752	994
North Dakota	579	868
Rhode Island	636	697
South Carolina	1,166	1,403
South Dakota	793	1,286
Utah	685	751
West Virginia	1,159	1,606
Wisconsin	3,024	4,642
District of Columbia	622	405
Totals	21,717	27,907

Now there are six Austin models!

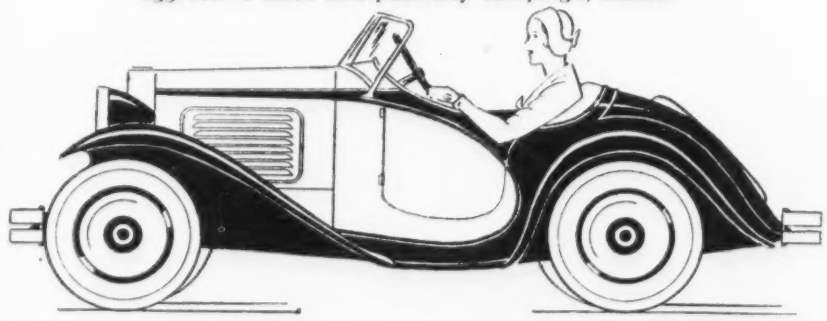
A wide variety in low cost transportation

With new models, new low prices, the Austin line gives your customer plenty of choice. And any one of these bantams has a running cost lower than any other form of automotive transportation!

An Austin runs 5,000 miles on $36 worth of gas, oil and tires. It goes 40 miles on a gallon of gasoline—more sometimes, say letters from hundreds of owners after months of all-weather driving. These facts talk the kind of language that is making customers sit up and listen this year.

Dealers and distributors can tie in with an aggressive sales and publicity campaign, including an ocean to ocean economy run for Austin owners in which important cash prizes are to be offered.

The line includes the lowest-priced cars on the market. And a generous discount means a healthy profit on each sale. Send for details on the Austin franchise in your territory.



Business Coupe	$330
Standard Coupe	$395
Runabout	$395
De Luxe Coupe	$525
Cabriolet	$550
Panel Delivery	$450

All prices f. o. b. Butler, Pa.

Bantam Motors *are available for industrial use.*

THE AMERICAN Austin

THE AMERICAN AUSTIN CAR COMPANY, INC., BUTLER, PA.

Boosts Business With Plan To Keep Fords in Repair a Whole Year for 5 Cts. a Day

"FIVE cents a day will keep your Ford car in repair for a year." Large billboards and street car advertising proclaim this message to the public of Vancouver and other parts of British Columbia, on behalf of the Stonehouse Motors, Ltd., West Georgia Street, Vancouver, and considerable business has been the result of this campaign.

One of the most successful advertising mediums ever inaugurated by a motor dealer organization in Canada is this scheme of Stonehouse Motors for keeping a new Ford model A car in repair for 5 cents a day for one year. The scheme was first instituted by Stonehouse Motors, Ltd., of Vancouver in the early part of 1927, when it agreed to keep one of the old model Ford cars in repair for 7 cents a day.

However, the year in which the plan was adopted was the final year of the old type of Ford car, and with the introduction of the new model A type the scheme was temporarily abandoned. Now, several years later, the scheme has been revived in new form.

The main feature of the maintenance contract is to present the value of the Ford guarantee in a new light. The habits of the numerous unscrupulous business men today have been such that a guarantee is "not what it used to be" in public opinion, according to Mr. S. B. Stonehouse, president of Stonehouse Motors, Ltd. Mr. Stonehouse states that, as a result, the maintenance contract of a reputable firm does much to restore the pledge of value given to its former rank in business.

The Stonehouse guarantee is really an addition to the guarantee of the Ford Company itself.

This company undertakes to keep the car in repair for three months. The Stonehouse guarantee takes up the protection of the buyer's interest at the point where the manufacturer's guarantee ends. Stonehouse Motors are themselves protected by the blanket warranty of the Ford Company against defective material and bad workmanship, so that while not incurring grave risks from the dealer's point of view, the five cent a day system brings out the advantages of the economy of the Ford.

The policy of the Stonehouse company in drawing this scheme up, according to Mr. Stonehouse, president of the firm, was to serve a five-fold purpose. The scheme brought out the low operating cost of Ford cars, and proved of value when a customer was found to be undecided as to which car he would buy. Two other points which the scheme served successfully was to hold the buyer of the new car to the garage of the Stonehouse Motors for future repair work and supplies, while it also protected the owners against spurious parts in unknown garages. The plan also brought the buyer in constant touch with the firm, and when he intended to trade in his car, the company was one of the first to know that he was again in the market. The last purpose served by the five cent a day plan, and in Mr. Stonehouse's opinion the most important, is that the policy gave an open challenge on the basis of economic operation.

The plan has been of value in training the owner in the care of his car during its initial service period, and increased the durability of its period of active service. Owners of fleets of cars have grasped the scheme as being of genuine value to them in providing them with a basis of checking operation costs of cars driven by their employees.

R. O. Fry, general manager of Stonehouse, is well aware of the value of advertising, and every street car and hundreds of billboards throughout the Greater Vancouver and Lower Mainland area of British Columbia point out the numerous advantages of Ford ownership.

Mr. Fry explains that membership cards entitling purchasers of new cars to the advantages of the five cent a day plan are sold only at the time when their new Ford car is being purchased from Stonehouse Motors, and it is signed by the customer at the time that the car contract is being signed.

A sub-contract form covering the year's service has been printed by the firm. It is stipulated on the form that the purchaser shall be only entitled to this service through the service station of Stonehouse Motors, Ltd. Not only does the firm undertake to keep the car in repair in the shape of labor, but it also undertakes to keep the car supplied with any new parts which may be required for the general running operation of the engine.

Of course, no responsibility is accepted by the firm for damages resulting from accidents, collisions, wrecks, or driving cars without oil, or as a result of the installation of parts in any other garage. Oil, grease and gasoline do not figure in any shape or form in this contract, but are charged for at regular rates.

22 YEARS

OF FITTING THE TRUCK TO THE JOB—NOT THE JOB TO THE TRUCK

For this long period of years BROCKWAY - INDIANA TRUCKS have been keyed to the carefully analyzed needs of every truck-using industry.

That this principle of building motor trucks to fit the job is receiving wide endorsement is shown by the rapidly increasing fleets of Brockway-Indianas among the largest fleet operators in the leading industries.

BROCKWAY-INDIANA TRUCKS

BROCKWAY MOTOR TRUCK CORP.,
Cortland - - - - New York

U. S. RUBBER NAMES MOODY FACTORY MANAGER

Detroit, May 14.—Appointment of C. L. Moody as factory manager of the main plant of the U. S. Rubber Company's tire department in Detroit is announced by J. F. O'Shaughnessy, general manager of the department. Moody succeeds Earl L. Bryant, who will devote his entire time to special work in the co-ordination of tire factory operations.

Before assuming his present position, Moody was manager of the Dominion Rubber Company's tire factory at Kitchener, Ont. This company is the Canadian subsidiary of the U. S. Rubber Company before joining U. S. Moody was general superintendent of the Fisk plant at Chicopee Falls, Mass.

Chevrolet Sales in Jersey For April Near 1929 Record

NEWARK, N. J., May 14.—Chevrolet sales in New Jersey during April were approximately 80 per cent. ahead of March and 20 to 30 per cent. greater than in April last year, according to a survey of leading dealers.

Some dealers report that April sales surpassed even the April record of 1929, the greatest sales year for Chevrolet in New Jersey, and others report that Chevrolet sales so far in May are better than in May, 1929.

E. J. Foley, president of the Foley Chevrolet Motor Sales Company of this city, reports the month of April produced the largest number of orders taken for the month of April in the history of the Foley company, which has been selling Chevrolet cars for the past ten years.

This company sold more than 200 new cars in April, while its used car business was also at a high mark.

William Hufnagel, Chevrolet dealer in North Bergen, reports new car sales in April nearly 100 per cent. greater than April last year, in spite of seventeen orders that the concern was unable to deliver because of a lack of cars.

Joseph Joyce, manager, says that May sales, from present indications, will be 100 per cent. better than May, 1930, with the outlook for a record year bright.

"In the last twelve orders taken this month," Mr. Joyce said, "there were only four trade-ins, indicating that Chevrolet sales with us are not replacements, but virgin business.

"Our used car business and service work are also at new high records for the year and the outlook for the rest of the year is bright."

An indication of how Chevrolet sales have been in recent weeks is the report from Gibbs Chevrolet Company of East Orange of the sales of 22 new cars, all individual orders.

The Coast Chevrolet Company, Inc. of Manasquan, also reporting excellent new and used car business, reports that accessory sales are keeping pace with car sales and that although the concern makes no special inducements to its salesmen, and has no special combination of extra equipment, it tries to sell with each new car its average accessories, amounting to about $40.

Reports from Chevrolet dealers in small communities show little variance with those from the larger centers.

CHANGE OF OWNERSHIP

Los Angeles, May 14.—Budd Wheel Company of California has been sold to Pacific Rim and Wheel Service, 324 West Venice Boulevard. J. A. Padden is head of the latter company. In addition to acquiring the local headquarters of the Budd California company, Pacific Rim and Wheel Service has also taken over the San Francisco branch of Budd at 1581 Bush Street.

make the selling job easier, whether it's trucks or buses. In sturdiness, efficiency, and accessibility, they answer all questions about axles.

WISCONSIN AXLE CO.
Oshkosh Wisconsin

Cumulative New Commercial Car Registration Statistics, April, 1931

Returns for today: Florida and Rhode Island.

Figures in this table are from R. L. Polk & Co. of Detroit, with the exception of Illinois, which are supplied by the Robinson Advertising Service, Springfield, Ill., and New Jersey, which are furnished by the New Jersey Motor List Co., New Car Division, Trenton, N. J. Some of this data has been published previously, but it is given here complete for the convenience of our subscribers. Readers desiring county, city or town lists, or lists of owners in any given section, may obtain these by addressing any of these three companies. Commercial car registrations do not include busses. In this table twelve states and the District of Columbia.

States	Autocar	Brockway-Indiana	Chevrolet	Diamond-T	Dodge	Essex	FWD	Fargo	Federal	Ford	G. M. C.	International	La France-Republic	Mack	Paige	Relay	Reo	Rugby	Sterling	Stewart	Studebaker	Whippet	White	Willys	Willys-Knight	Miscellaneous	Totals	States
Delaware	4		35		1					78		9		2			1			1	2						133	Delaware
Florida			144		6					259	2	13					2						1			1	428	Florida
Illinois	2	10	513	33	77			1	16	816	23	121	1	10			7		8	3	32		1	19	4	78	1775	Illinois
Minn.			385	16	40		2		3	437	15	84	13	4	1	1	9	1			12	1	6	23		7	1060	Minn.
Montana			58		8			1		107	1	26					1						2	2		4	210	Montana
Nor. Dak.			87		14					92	1	46					7	1			2	1		3			254	N. Dakota
Rho. Isl.	2	2	45		12				2	134	3	9		2			4		1				2	1			219	Rh. Island
Sou. Car.		2	186		11				1	150		6									1		1		7	365	S. Carolina
S. Dakota			79	6	10		1			57	1	30					2				7	2		3			198	S. Dakota
Utah			69		5					100	4	11		1	1		3				1					6	201	Utah
West Va.	2	1	148		21				1	209	18	26	3				3			1	1			6		4	444	West Va.
Wisconsin			374	21	22	1	1		7	384	14	54	1	1		3	6		6	4	16	1	3	9	1	16	945	Wisconsin
D. of C.	10	1	33	4	12				2	147	9	16	1	4		1	2		1		1		4			5	253	Dis. of Col.
Totals	20	16	2156	80	239	1	4	2	32	2970	91	451	19	24	2	5	47	2	16	9	75	5	20	66	5	128	6485	Totals
Del., 1930	5	4	46		1			1		64	6	9	1				6						1			1	145	Del., 1930
Fla., '30		2	122		9					230	7	10		1			4					1	6				392	Fla., 1930
Ill., 1930	8	20	663	54	72	2		9	19	932	41	111	1	17	3	2	26	2	5	7		14	12	13	1	79	2113	Ill., 1930
Minn., '30		9	560	11	60	1		3	4	765	28	129		9			32				4	10	12	16	3	3	1659	Minn., '30
Mont., '30			66		3			4		95	5	29		2			3					1	5	4	1	3	221	Mont., '30
N. D., '30			112	1	9			1		144	2	77		1	1		11	1						11	2		373	N. D., 1930
R. I., 1930	1	2	60		15			1	10	126	18	10		6	1		3		1	1	3		1			2	261	R. I., 1930
S. C., '30			166		3			1	4	139	3	5		1			1						5	1		1	330	S. C., 1930
S. D., '30			79	1	9		1	2		90	2	44	1	2			12	1				3		6			253	S. D., '30
Utah, '30			80		11	2	1			144	2	22		2			3				1					3	271	Utah, 1930
W. V., '30		3	205	4	34	1				245	17	44	1	1	1	1	15			2		2		3	1	6	586	W. V., '30
Wis., 1930		3	568	29	36	1	7	3	7	807	32	124		2	2	6	31	2	15	7	2	9	6	9	1	14	1723	Wis., 1930
D. C., '30	5		17	2	3				1	85	13	1		1								1	6			1	136	D. C., '30
Totals	19	43	2744	102	265	7	9	25	45	3866	176	615	4	45	8	9	147	6	21	17	10	41	54	63	9	113	8463	Totals

Combined report: American La France and La France Republic.

Chrysler Adds New Line Of De Luxe Eight Bodies

(Continued from Page 1)

lencer, fuel strainer and crankcase ventilator.

The de luxe models use the Chrysler four-speed transmission, with dual-high internal mesh gears.

The clutch is of the single plate dry disc type, with a ball clutch release bearing.

The final gears offered in the de luxe sedan are 4.3 to 1 in driving high, 5.93 to 1 in traffic high, 10.66 to 1 in starting, 15.61 to 1 in low and 12.28 to 1 in reverse. In the de luxe coupes and roadster the ratios are 3.91 to 1 in driving high, 5.39 to 1 in traffic high, 9.70 to 1 in starting, 14.91 in low and 12.28 to 1 in reverse.

The Chrysler four-wheel hydraulic brakes used are internal expanding in 12-inch drums, with a total braking area of 143.8 square inches, have an improved type brake drum with a special alloy rim contacting with the brake shoes. This alloy, it is claimed, dissipates heat more rapidly than steel and expansion and contraction of the brake drum are reduced and more uniform.

The front spring has a length of 38 in., and a rear spring a length of 54⅝ in., with eight leaves in each spring. The semi-elliptic springs are mounted in rubber bushings at all points of frame contact, while the new Oilite bronze bushings are used at the rear ends.

Its length and the low-swung effect resulting from the double-drop frame give the car a distinctive appearance. Overall length from bumper to bumper is 188 in.; overall height is 68 in.

The use of wood insulation between the body and the heavy frame of the de luxe models adds to the quietness of the ride.

Seventeen-inch wheels and large 6.50x17 six-ply oversize tires maintain a normal road clearance, and at the same time add to the appearance and contribute to improved roadability and riding qualities. Five wire wheels are standard equipment, with four wood wheels and spare rim optional.

Features incorporated in the new de luxe models include double windshield with chrome-plated frames, pointed radiator fitted with radiator cap mounting figure of a gazelle, carpeted cowl panels inside individual sun visors covered with the same material as the head lining, which are adjustable to any angle.

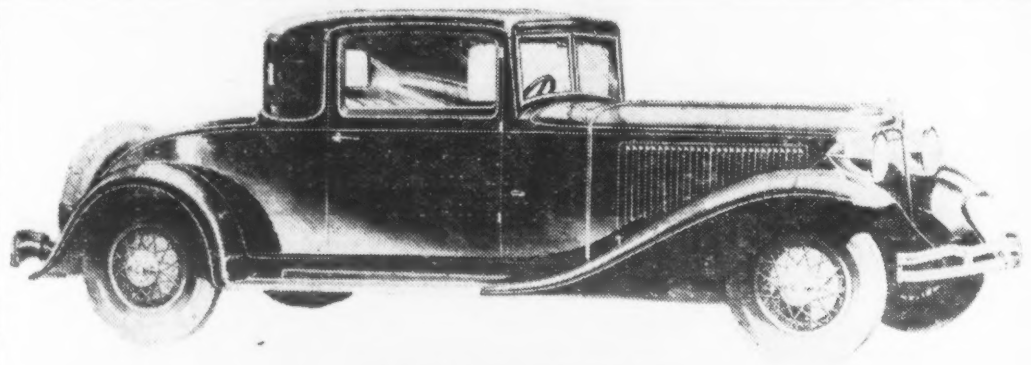
Closed models are upholstered in Bedford cord and trimmed with upholstery lace; the open bodies are leather upholstered. Marshall type springs, encased in cloth pockets feature the seat and back construction, and, it is claimed, combined with a new method of tufting the upholstery provide comfortable seating accommodations.

The front seat is low and solidly anchored to the center pillars. The back of the driver's seat is adjustable over a range of 3¼ inches. The steering column is adjustable to three positions.

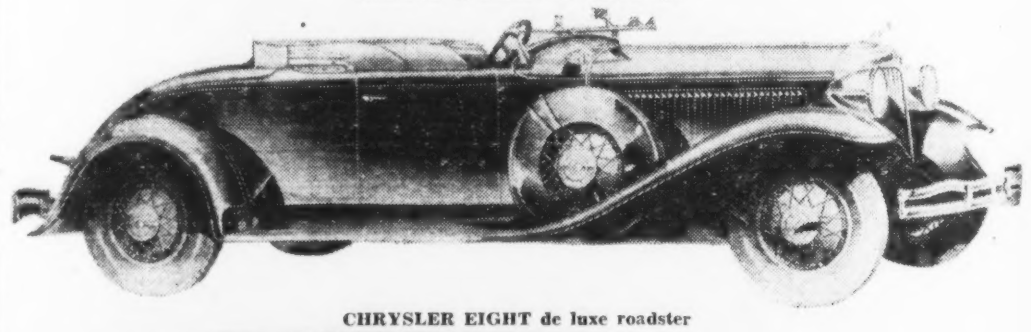
Arm rests in the rear compartment of the sedan are of a new design, shaped for practical use, with smoking sets conveniently built in at the end of the arm rest. Floor carpetings are of high-pile quality.

All the de luxe models have a new walnut finish instrument panel with the instrument, including a 100 m.p.h. speedometer. Windshield header molding, windshield side and center molding and all window moldings are in dark walnut finish. A depression in the header molding permits easy access to the double windshield adjustment clamps. Interior beauty is enhanced by a liberal use of bright metal. The dome light of the sedan is automatically controlled by a door switch. A light switch is also provided on the right inside door pillar.

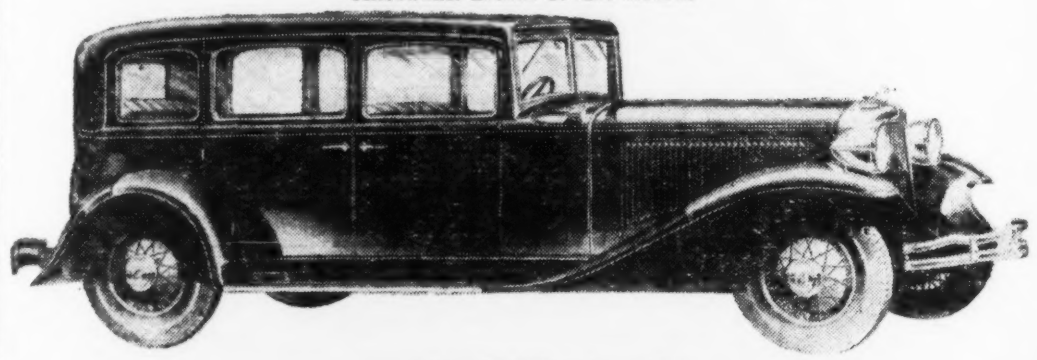
The de luxe models are offered in a variety of color combinations



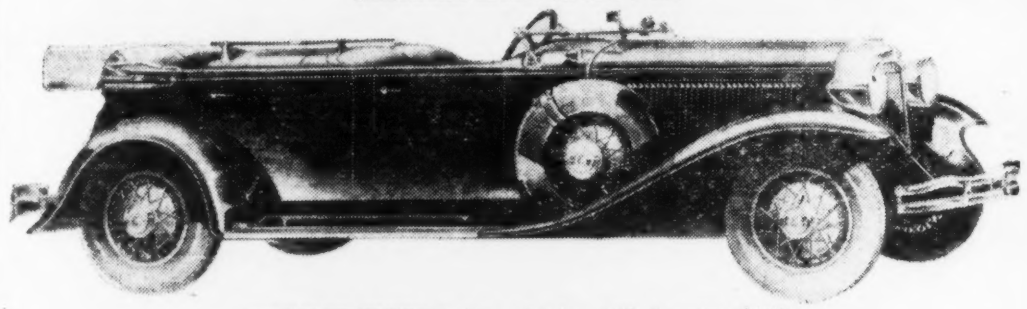
CHRYSLER EIGHT de luxe coupe



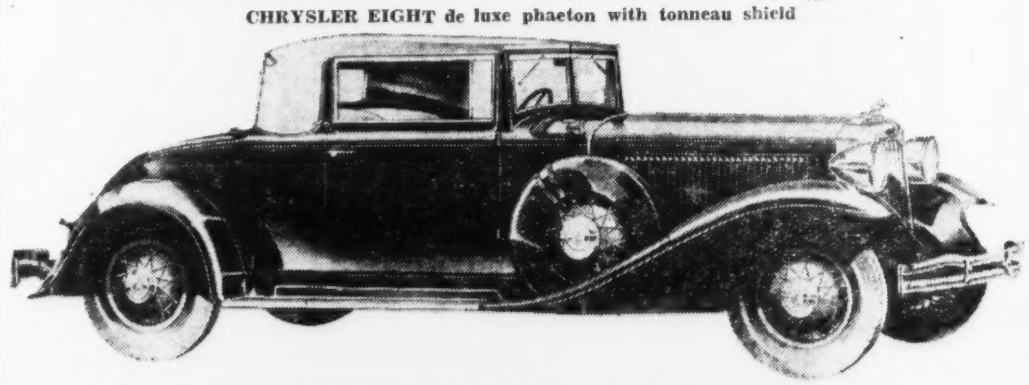
CHRYSLER EIGHT de luxe roadster



CHRYSLER EIGHT de luxe sedan



CHRYSLER EIGHT de luxe phaeton with tonneau shield



CHRYSLER EIGHT de luxe convertible coupe

VIEW OF CHRYSLER EIGHT de luxe sedan of one-piece welded steel construction. It is heavily insulated

New Financial Responsibility Act Effective in New Jersey

TRENTON, N. J., May 14.—Two of three measures of importance to the automotive industry of New Jersey are effective today, while the third becomes operative after July 1, according to Harold G. Hoffman, motor vehicle commissioner.

The laws now in effect are the modified financial responsibility law and the compulsory car test. The new title law will be in force July 1.

The law regulating the transfer of motor vehicles clarifies the bill of sale procedure, according to Mr. Hoffman.

This new bill of sales or titling act requires the commissioner to license automobile dealers to handle title papers and provides for the recognition and registration of motor vehicles covered by conditional sales contracts. Under the new system it is practically impossible to fabricate or forge original titling papers, which will be filed with the commissioner of motor vehicles. Title papers will be serially numbered and only watermarked paper will be used and through the licensing of dealers this system will comprehend and cover all sales of both new and used cars.

Another measure which has become law and which had the unqualified approval of Commissioner Hoffman provides for the annual inspection of automobiles and a certificate rendered showing the car equipped with adequate safety devices, such as brakes, properly focused lights, mirror and horn. sit for obtaining the succeeding Such a cetificate will be a prerequiyear's registration for the car.

Responsible dealers are to be appointed by the motor vehicle comsioner as official stations for such inspections and a fee, not exceeding $1, may be charged for such inspections. The inspecion period, according to the new act, is on proclamation of the governor.

The most important, probably, is the law which changes the feature of the financial responsibility act so as to make it less harsh and remove some of its inequities.

The new law restricts the establishment of financial responsibility to four major offenses—operating a motor vehicle while intoxicated; hit and run driver; reckless driver and accidents which result in death or injuries to persons or property damage to the extent of at least $100.

Provision is also made to cover the situation in which an automobile carries insurance, the person violating the act is either a chauffeur or member of the family, but does not own a car of his own, as contrasted with the old law, which required unnecessary duplication of insurance in the same automobile, with two or more premiums for the same hazard.

The old law was based on the principle that every dog is entitled to one bite and that every motorist is entitled to one crash. It did nothing to protect the innocent victim of the first accident of a person having no financial responsibility, but simply required that for the next three years the motorist responsible for the accident had to furnish proof of financial responsibility.

In the present act this condition has been eliminated by the requirement that the commissioner of motor vehicles shall withhold the driving privilege or registration of the person who has been determined by the court to be responsible for an accident and who fails within thirty days to satisfy a judgment.

IN NEW QUARTERS

Great Falls, Mont., May 14.—The Western Auto Supply Company, which has its headquarters in Great Falls, at 515 Central Ave., has moved to a new location at 619 Central Ave., Arthur F. Belzer, manager here, announced. Besides large store space for the sale of accessories, the new site affords plenty of room in the rear for the mounting of tires and installation of batteries, Mr. Belzer said.

Major Specifications and Mechanical Details of 1931 Commercial Cars

Make and Model	Capacity—Tons or Lbs.	Chassis Price	Engine	Valve Arr'g'm't	No. of Cyls.	Bore and Stroke	Piston Disp.	Tax H. P.	Max. Brake H. P. and Peak P. P. M.	Type Camshaft Drive	Radiator Make	Clutch Make	Universals Make	Steering Gear Make	Carburetor Make	Fuel Feed Type	Make Electr'l System	Make Transmission	No. Spds. For.	Rear Axle Make	Type Final Drive	Final Gear Reduction	Type Service Brakes	Area Service Brakes	Standard Wheel Base	Chassis Weight	Standard Tire Sizes Front	Rear
*Am. La France Chief	2½	3650	Own	L	6	3¾x5	331.0	33.7	65@2100	G	G & O	Borg	Spic	Ross	Str	Vac	DR	Own	4	Tim	Wo	31.2	B4IM	—	156	6200	32x6	32x6D
*Am. La France Chieftain	3-4	5500	Own	L	6	4⅛x5⅛	411.0	40.8	75@1800	G	G & O	Borg	Spic	Ross	Zen	Vac	DR	Own	4	Tim	Wo	28.8	B4IM	—	175	7200	36x8S	36x8D
Am. La France Big Chief	6	6725	Own	I	6	4½x6	——	48.6	50@1200	I	—	—	—	—	Zen	Vac	DR	Own	4	Own	2 R	32.8	——	—	226	10600	40x8S	40x8SD
Austin	400	475	Own	L	4	2.2x3	45.6	7.8	13@3000	G	Hex	Rock	Spic	Own	Til	Gra	Aut	W-G	3	Sal	Sp	5.25	O4M	76.5	75	1210	3.75x18	3.75x18
Autocar A	1½-2	3200	Own	L	6	4 x4¾	358.0	38.4	82@2400	G	Per	Long	Spic	Ross	Str	Vac	DR	Br-L	4	Own	Sp	27.9	LO4ID	460	150	5060	34x7	34x7
Autocar B	2-2½	3500	Own	L	6	4 x4¾	358.0	38.4	82@2400	G	Per	Long	Spic	Ross	Str	Vac	DR	Br-L	4	Own	2 R	33.5	LO4ID	460	150	5300	34x7	34x7D
†Autocar SH	2½-3	4300	Own	L	6	4¼x4¾	404.0	43.4	92@2400	G	Own	Long	Spic	Ross	Str	Gra	DR	Own	4	Own	2 R	44.0	O2IM	328	114	6770	34x7	34x7D
†Autocar SCH	2½-3	4300	Own	L	6	4¼x4¾	404.0	43.4	92@2400	G	Own	Long	Spic	Ross	Str	Vac	DR	Own	4	Own	2 R	44.0	O2IM	328	157	6860	34x7	34x7D
†Autocar H	3	4100	Own	L	4	4½x5½	350.0	32.4	45@1450	G	Own	Long	Spic	Ross	Str	Gra	DR	Own	4	Own	2 R	46.6	O2IM	328	114	6770	34x7	34x7D
†Autocar HS	3½	4600	Own	L	4	4½x5½	350.0	32.4	45@1450	G	Own	Long	Spic	Ross	Str	Gra	DR	Own	4	Own	2 R	54.3	O2IM	516	114	7900	40x8	40x8D
†Autocar SHS	3-3½	4800	Own	L	6	4¼x4¾	404.0	43.4	92@2400	G	Own	Long	Spic	Ross	Str	Gra	DR	Own	4	Own	2 R	54.3	O2IM	516	114	7900	40x8	40x8D
Autocar SCHS	3-3½	4800	Own	L	6	4¼x4¾	404.0	43.4	92@2400	G	Own	Long	Spic	Ross	Str	Vac	DR	Own	4	Own	2 R	54.3	O2IM	516	157	8180	40x8	40x8D
Autocar N	3-3½	4600	Own	L	6	4¼x4¾	404.0	43.4	92@2400	G	Own	Long	Spic	Ross	Str	Vac	DR	Own	4	Own	2 R	41.2	OL4IH	574	174	7900	36x8	36x8D
Autocar TEA	3-3½	5350	Own	L	6	4¼x4¾	404.0	43.4	92@2400	G	Own	Long	Spic	Ross	Str	Vac	DR	Own	12	Own	2 R	101.1	LO4ID	602	192	8900	36x8	36x8D
Autocar TFA	3½-5	6100	Own	L	6	4½x4¾	453.0	48.6	101@2400	G	Own	Long	Spic	Ross	Str	Vac	DR	Own	12	Own	2 R	101.3	LO4ID	602	192	9300	38x9	38x9D
Autocar C	3½-5	5500	Own	L	6	4½x4¾	453.0	48.6	101@2400	G	Own	Long	Spic	Ross	Str	Vac	DR	Own	4	Own	2 R	51.7	O2IM	516	172	9500	42x9	42x9D
Autocar F	7½	6800	Own	L	6	4½x4¾	453.0	48.6	101@2400	G	Own	Br-L	Spic	Ross	Str	Vac	DR	Br-L	7	Tim	Wo	94.0	LT4DV	674	173	11000	36x7S	40x8SD
*Autocar G	10	9000	Own	L	6	4½x4¾	453.0	48.6	101@2400	G	Own	Br-L	Spic	Ross	Str	Vac	DR	Br-L	7	Tim	Wo	100.0	T6IA	720	171	13000	36x8	36x8D
Autocar N A	22000	4600	Own	L	6	4¼x4¾	404.0	43.4	92@2400	G	—	—	Spic	——	Str	Vac	DR	—	4	Own	2 R	54.3	OL4IH	574	174	7990	36x8	36x8D
Autocar N B	22000	4700	Own	L	6	4¼x4¾	404.0	43.4	92@2400	G	—	—	Spic	——	Str	Vac	DR	—	4	Own	2 R	54.3	OL4IH	574	192	8168	36x8	36x8D
Autocar N C	22000	4830	Own	L	6	4¼x4¾	404.0	43.4	92@2400	G	—	—	Spic	——	Str	Vac	DR	—	4	Own	2 R	54.3	OL4IH	574	218	8329	36x8	36x8D
Autocar N D	22000	4950	Own	L	6	4¼x4¾	404.0	43.4	92@2400	G	—	—	Spic	——	Str	Vac	DR	—	4	Own	2 R	54.3	OL4IH	574	242	8486	36x8	36x8D
Brockway 90	*6000	995	Con	L	6	3¾x4	214.7	27.3	61@3000	C	G & O	Borg	Spic	Ross	Zen	P	Aut	W-G	3	Col	Sp	19.8	B4IM	297	132	3200	30x5	30x5
Brockway 95	6500	1195	Con	L	6	3¾x4½	248.2	27.3	65@2700	C	G & O	Borg	Spic	Ross	Zen	Vac	Aut	Br-L	3	Col	Sp	21.3	C4IM	244	137	3400	30x5	30x5
Brockway 75	7500	1290	Con	L	6	3¾x4½	248.2	27.3	65@2700	C	G & O	Borg	Spic	Ross	Zen	Vac	Aut	Br-L	4	Col	Sp	25.6	C4IM	244	137	3450	32x6	32x6
Brockway 90	9000	1525	Con	L	6	3¾x4½	248.2	27.3	65@2700	C	G & O	Borg	Spic	Ross	Zen	Vac	Aut	Br-L	4	Col	Sp	30.9	C4IM	292	149	4050	32x6	32x6
Brockway 120	12000	1990	Con	H	6	4 x4⅛	311.0	38.4	73@2400	C	G & O	Br-L	Spic	Ross	Zen	P	Aut	Br-L	4	Tim	Sp	31.3	L4IH	353	156	5200	32x6	32x6D
Brockway 140	14000	2495	Con	H	6	4 x4⅛	311.0	38.4	73@2400	C	G & O	Br-L	Spic	Ross	Zen	P	Aut	Br-L	4	Wis	2 R	35.3	L4IHV	356	156	5500	32x6	32x6D
Brockway 141	17000	2935	Con	H	6	4 x4⅛	311.0	38.4	73@2400	C	G & O	Br-L	Spic	Ross	Zen	P	Aut	Br-L	4	Wis	2 R	46.2	L4IHV	356	170	6200	32x6	32x6D
Brockway 141	17000	2935	Con	H	6	4 x4⅛	311.0	38.4	73@2400	C	G & O	Br-L	Spic	Ross	Zen	P	Aut	Br-L	4	Wis	2 R	46.6	L4IHV	380	170	6800	32x6	32x6D
Brockway 170	17000	3160	Con	H	6	4¼x4¾	380.9	40.8	89@2400	C	G & O	—	Spic	Ross	Zen	P	Aut	—	5	Wis	2 R	45.3	L4IHV	380	170	7200	34x7	34x7D
Brockway 175	17500	3660	Con	H	6	4¾x4¾	427.5	45.9	100@2400	C	G & O	Br-L	Spic	Ross	Zen	P	Aut	Br-L	4	Wis	2 R	49.5	L4IHV	471	170	7500	34x7	34x7D
Brockway 195	19500	3820	Con	H	6	4¼x4¾	380.9	40.8	89@2400	C	Long	Borg	Spic	Ross	Zen	P	Aut	Br-L	7	Tim	Wo	78.6	T2IMV	471	168½	7625	34x7	34x7D
Brockway 190	19000	4185	Con	H	6	4¼x4¾	380.9	40.8	89@2400	C	G & O	Br-L	Spic	Ross	Zen	P	Aut	Br-L	4	Wis	2 R	50.7	L4IHV	546	170	8200	36x8	36x8D
Brockway 220	22000	4560	Con	H	6	4¾x4¾	427.5	45.9	100@2400	C	Long	Br-L	Spic	Ross	Zen	P	Aut	Br-L	4	Tim	Wo	63.7	LT4IVA	664	182	10000	40x8	40x8D
Brockway 250	25000	5950	Con	H	6	4¾x4¾	427.5	45.9	100@2400	C	Long	Br-L	Spic	Ross	Str	P	L-N	Br-L	7	Tim	Wo	95.0	T4IA	676	182	10750	38x7P	40x14S
Brockway 290	30000	7250	Con	L	6	4¾x5¾	611.4	54.1	116@1800	C	Long	Br-L	Spic	Ross	Str	P	L-N	Br-L	7	Tim	Wo	90.9	T4IA	864	212	14000	38x7P	36x10S
*Brockway 610	40000	9700	Con	L	6	4¾x5¾	611.4	54.1	116@1800	C	Long	Br-L	Spic	Ross	Str	P	L-N	Br-L	7	Tim	Wo	90.9	T4IA	864	212	14000	38x7P	36x10S
Chevrolet	½	355	Own	H	6	3⅛x3¾	194.0	26.3	50@2600	G	Har	Own	Own	Own	Car	P	DR	Own	3	Own	Sp	13.6	O4IM	101	109	1880	19x4.75	19x4.75
Chevrolet	1½	590	Own	H	6	3⅛x3¾	194.0	26.3	50@2600	G	Har	Own	Own	Own	Car	P	DR	Own	4	Own	Sp	33.4	O4IM	170	157	2890	30x5	30x5D
Chevrolet	1½	520	Own	H	6	3⅛x3¾	194.0	26.3	50@2600	G	Har	Own	Own	Own	Car	P	DR	Own	4	Own	Sp	33.4	——	—	131	2560	30x5	32x6
Commerce Series S 11	1	1600	Bud	L	6	3⅜x4½	241.6	27.3	53@2200	G	Long	Br-L	Blo	Han	Zen	Vac	Aut	Br-L	4	Col	Sp	25.5	L4IH	297	142	3900	30x5P	30x5P
Commerce Series S 11	1½	1900	Bud	L	6	3⅜x4½	241.6	27.3	53@2200	G	Long	Br-L	Blo	Han	Zen	Vac	Aut	Br-L	4	Tim	Sp	29.2	L4IH	297	162	4300	30x5P	30x5DP
Commerce Series 40	1½	2890	Bud	L	6	3⅜x5	309.6	31.5	64@2100	G	Long	Br-L	Blo	Han	Zen	Vac	Aut	Br-L	4	Tim	Wo	34.8	L4IH	394	168	4700	34x5P	34x5DP
Commerce Series S 11	2	2030	Bud	L	6	3⅜x4½	241.6	27.3	53@2200	G	Long	Br-L	Blo	Han	Zen	Vac	Aut	Br-L	4	Tim	Sp	29.2	L4IH	297	162	4500	32x6P	32x6D
Commerce Series 40	2	3240	Bud	L	6	3⅜x5	309.6	31.5	64@2100	G	Long	Br-L	Blo	Han	Zen	Vac	Aut	Br-L	4	Tim	Wo	34.8	L4IH	394	168	4900	32x6	36x6D
Commerce Series 40	2½	3240	Bud	L	6	3⅜x5	309.6	31.5	64@2100	G	Long	Br-L	Blo	Han	Zen	Vac	Aut	Br-L	4	Tim	Wo	34.8	L4IH	394	168	5100	36x6P	36x6D
Commerce Series 60	2½	4530	Bud	L	6	4¼x5⅛	410.9	40.8	83@2100	G	Long	Ful	Blo	Han	Zen	Vac	Aut	Ful	5	Tim	Wo	63.0	L4IH	584	175	7000	36x6P	36x7D
Commerce Series 60	3	4680	Bud	L	6	4¼x5⅛	410.9	40.8	83@2100	G	Long	Ful	Blo	Han	Zen	Vac	Aut	Ful	5	Tim	Wo	63.0	L4IH	584	175	7100	36x6P	36x7D
Commerce Series 80	3½	5250	Bud	L	6	4¼x5⅛	411.0	40.8	83@2100	G	Long	Own	Blo	Ross	Zen	Vac	Aut	Br-L	7	Tim	Wo	98.2	——	—	175	8200	36x6S	36x12S
Commerce Series 80	4	5330	Bud	L	6	4¼x5⅛	411.0	40.8	83@2100	G	Long	Own	Blo	Ross	Zen	Vac	Aut	Br-L	7	Tim	Wo	98.2	——	—	175	8400	36x6S	36x14S
Commerce Series 100	5	5830	Bud	L	6	4¼x5⅛	411.0	40.8	83@2100	G	Long	Own	Blo	Ross	Zen	Vac	Aut	Br-L	7	Tim	Wo	95.0	——	—	175	9600	36x6S	40x14S
Day Elder 60	1	1095	Con	L	6	3¾x4	214.7	27.3	61@3000	C	G & O	Borg	Spic	Ross	Zen	P	DR	W-G	4	Tim	Sp	36.3	B4IM	241	135	3200	20x6.00B	20x6.50B
Day Elder 85	1½	1645	Con	L	6	3⅞x4⅜	248.3	27.3	65@2700	C	Per	Borg	Spic	Ross	Zen	P	DR	W-G	4	Tim	Sp	42.3	L4IH	229	135	3750	20x6.00B	20x6.50DB
Day Elder 110	2	2095	Con	L	6	3⅞x4⅜	248.3	27.3	65@2700	C	Per	Br-L	Spic	Ross	Zen	P	DR	Br-L	4	Tim	Sp	44.9	L4IH	306	156	4600	20x7.00B	20x7.00DB
Day Elder 130	2½	2895	Con	H	6	4 x4⅛	311.0	38.4	73@2400	C	Per	Br-L	Spic	Ross	Zen	P	DR	Br-L	4	Tim	Sp	40.7	L4IH	354	156	6400	20x7.50B	20x7.50DB
Day Elder 160	3	3695	Con	H	6	4 x4½	339.3	38.4	82@2400	C	Per	Br-L	Spic	Ross	Zen	P	DR	Br-L	4	Tim	Wo	36.1	L4IH	398	156	6600	20x7.50B	20x9.00DB
Day Elder 200	4	4295	Con	H	6	4 x4½	339.3	38.4	82@2400	C	Per	Br-L	Spic	Ross	Zen	P	DR	Br-L	4	Tim	Wo	43.5	L4IHV	489	156	7400	20x9.00B	20x9.00B
Day Elder 240	5	5500	Con	H	6	4¼x4¾	427.5	45.9	100@2600	C	Per	Br-L	Blo	Ross	Zen	Vac	DR	Br-L	4	Tim	Wo	50.8	L4IHV	520	162	9300	38x9P	38x9DP
*Day Elder 285	8	6000	Con	H	6	4¾x4¾	427.5	45.9	100@2600	C	Per	Br-L	Blo	Ross	Zen	Vac	DR	Br-L	7	Tim	Wo	71.2	L6IHV	674	164	12000	20x8.25B	20x8.25DB
*Day Elder 345	10	7500	Con	H	6	4¾x4¾	427.5	45.9	100@2600	C	Per	Br-L	Blo	Ross	Zen	Vac	DR	Br-L	7	Tim	Wo	79.9	T4rIA	490	164	12500	20x9.00B	20x9.00DB
*Day Elder 402	12	9000	Con	L	6	4¾x5¾	611.4	54.2	127@2300	G	Per	Br-L	Blo	Ross	Zen	P	DR	Br-L	7	Tim	Wo	84.6	T4rIA	490	164	14000	20x9.75B	20x9.75DB
Diamond T 216	1½	695	Her	L	6	3⅜x4½	228.0	27.3	56@2400	G	G & O	Borg	Spic	Ross	Zen	P	Aut	W-G	4	Cla	Sp	——	L4IH	252	135½	3130	20x6.50B	20x6.50B
Diamond T 291	1½	1475	Her	L	6	3½x4½	268.0	29.4	60@2400	G	G & O	Borg	Spic	Ross	Zen	P	Aut	Cov	4	Cla	Sp	——	L4IH	279	156¼	4500	20x6.50B	20x6.50DB
Diamond T 303	2-2½	1745	Her	L	6	3¼x4½	298.0	33.7	67@2400	G	G & O	Borg	Spic	Ross	Zen	P	Aut	Cov	4	Tim	Sp	——	L4IHV	408	168	5600	20x7.50B	20x7.50DB
Diamond T 551	2½-3	2250	Her	L	6	4 x4½	339.0	38.4	74@2400	G	G & O	Cov	Spic	Ross	Zen	P	Aut	Cov	4	Wis	2 R	——	L4IHV	408	176½	6400	20x8.25B	20x8.25DB
Diamond T 501	3	2675	Her	L	6	4 x4½	339.0	38.4	74@2400	G	G & O	Cov	Spic	Ross	Zen	P	Aut	Cov	5	Wis	2 R	——	L4IHV	408	184	6400	20x8.25B	20x8.25DB
Diamond T 506	3	3000	Her	L	6	4¼x4½	383.0	43.3	85@2200	G	G & O	Cov	Spic	Ross	Zen	P	Aut	Cov	5	Wis	2 R	——	L4IHV	499	169	7500	20x9.00B	20x9.00DB
Diamond T 603	3-4	3300	Her	L	6	4¾x4¾	428.4	45.9	94@2200	G	G & O	Cov	Spic	Ross	Zen	P	Aut	Cov	5	Wis	2 R	——	L4IHV	499	187½	7500	20x9.00B	20x9.00DB
Diamond T 606	3-4	3440	Her	L	6	4½x4¾	453.0	48.6	100@2200	G	G & O	Cov	Spic	Ross	Zen	P	Aut	Cov	5	Wis	2 R	——	W4I	552	178	8300	22x9.75B	22x9.75DB
Diamond T 750	4-5	4800	Her	L	6	4¾x5⅛	529.0	51.3	————		G & O	Cov	Spic	Ross	Zen	P	Aut	Cov	5	Wis	2 R	——	W4I	552	178	8300	22x9.75B	22x9.75DB
*Diamond T 801	4	4140	Her	L	6	4¾x4¾	428.4	45.9	94@2200	G	G & O	Cov	Spic	Ross	Zen	P	Aut	Br-L	7	Own	Wo	——	L6IHV	571	189½	8300	36x8P	36x8DP
*Diamond T 1200	6	5600	Her	L	6	4½x4¾	453.3	48.6	100@2200	G	G & O	Cov	Spic	Ross	Zen	P	Aut	Br-L	7	Tim	Wo	——	T4IA	238	190	11000	34x7P	34x7DP
*Diamond T 1600	8	6220	Her	L	6	4¾x4¾	479.0	51.3	104@2400	G	G & O	Cov	Spic-Blo	Ross	Zen	P	Aut	Br-L	7	Tim	Wo	——	T4IA	238	190	11700	36x8P	36x8DP
*Diamond T 1601	8	7500	Wak	L	6	5 x5¾	677.4	60.0	127@2000	G	G & O	Br-L	Spic-Blo	Ross	Zen	P	Aut	Br-L	7	Tim	Wo	——	T4IA	238	194	12500	36x8P	36x8DP
Dodge Bros. UF 10	½	515	Own	L	6	3¼x4¼	196.0	21.0	48@2800	G	Fed	Borg	Own	W-G	Car	P	DR	Own	3	Own	Sp	14.2	L4IH	114	109	1925	19x5.00	19x5.00
Dodge Bros. F 10	½	695	Own	L	4	3¼x4¼	211.5	25.3	66@3200	G	Fed	Borg	Un	W-G	Car	P	DR	Own	3	Own	Sp	14.2	L4IH	114	109	1975	19x5.25	19x5.25
Dodge Bros. U 1	¾	435	Own	L	4	3¼x4¼	196.0	21.0	45@2800	G	Fed	Borg	Spic	Han	Car	Vac	NE	Own	3	Own	Sp	21.6	L4IH	189	124	2260	20x5.50B	20x5.50B
Dodge Bros. DA 1	¾	795	Own	L	6	3⅛x3⅛	208.0	27.3	63@3200	G	Fed	Borg	Spic	Han	Car	Vac	NE	Own	4	Own	Sp	36.8	L4IH	189	124	2360	20x5.50	20x5.50
Dodge Bros.	1	795	Own	L	6	3⅛x3⅛	208.0	27.3	63@3200	G	Fed	Borg	Spic	Han	Car	Vac	NE	Own	3	Own	Sp	36.1	L4IH	205	133	2590	20x6.00	32x6
Dodge Bros.	1	895	Own	L	6	3⅛x3⅛	208.0	27.3	63@3200	G	Fed	Borg	Spic	Han	Zen	Vac	NE	Own	3	Own	Sp	33.4	L4IH	205	133	2690	20x6.00	32x6
Dodge Bros.	1½	595	Own	L	4	3¼x4¼	196.0	21.0	48@2800	G	Fed	Borg	Cle	W-G	Car	P	DR	Own	4	Own	Sp	37.1	L4IH	120	136	2581	20x6.00	32x6
Dodge Bros. UF 30	1½	679	Own	L	4	3¼x4¼	196.0	21.0	48@2800	G	Fed	Borg	Cle	W-G	Car	P	DR	Own		Own	Sp	32.1	L4IH	229	165	2757	20x6.00	32x6
Dodge Bros. UF 31	1½	770	Own	L	6	3¼x4¼	211.5	23.4	66@3200	G	Fed	Borg	Cle	W-G	Car	P	DR	Own		Own	Sp	32.1	L4IH	229	165	2807	20x6.00	32x6
Dodge Bros. F 31	1½	695	Own	L	6	3¼x4¼	211.5	25.3	66@3200	C	Fed	Borg	Cle	W-G	Car	P	DR	Own	4	Own	Sp	37.1	L4IH	120	136	2631	20x6.50	32x6
Dodge Bros. F 30	1½	695	Own	L	6	3⅜x3⅞	208.0	27.3	63@3200	G	Long	Borg	Cle	Han	Zen	P	DR	Own	4	Own	Sp	41.4	L4IH	311	140	3780	20x6.00	20x6.00D
Dodge Bros. F 35	1½	1425	Own	L	6	3⅜x3⅞	208.0	27.3	63@3200	G	Long	Borg	Cle	Han	Zen	P	DR	Own	4	Own	Sp	41.4	L4IH	311	165	3972	20x6.00	20x6.00D
Dodge Bros. F 36	1½	1485	Own	L	6	3⅜x3⅞	208.0	27.3	63@3200	G	Long	Borg	Cle	Sag	DL	P	DR	Own	4	Own	Sp	43.7	L4IH	350	150	5173	20x6.50	20x6.50D
*Dodge Bros. F 40	2	1995	Own	L	6	3⅛x5	309.6	31.5	96@3000	G	Long	Borg	Cle	Sag	DL	P	DR	Own	4	Own	Sp	43.7	L4IH	350	165	5211	20x6.50	20x6.50D
*Dodge Bros. F 41	2	2085	Own	L	6	3⅛x5	309.6	31.5	96@3000	G	Long	Borg	Cle	Sag	DL	P	DR	Own	4	Own	Sp	43.7	L4IH	350	165	5243	20x6.50	20x6.50D
Dodge Bros.	3	1845	Own	L	6	3⅜x4½	241	27.3	78@3000	C	Long	Borg	Un	Han	Zen	Vac	NE	Own	4	Own	Sp	46.3	L4IH	382	135	4235	32x6	32x6D
Dodge Bros.	3	1895	Own	L	6	3⅜x4½	241	27.3	78@3000	C	Long	Borg	Un	Han	Zen	Vac	NE	Own	4	Own	Sp	41.4	L4IH	382	165	4520	32x6	32x6D
Dodge Bros.	3	1945	Own	L	6	3⅜x4½	241	27.3	78@3000	C	Long	Borg	Un	Han	Zen	Vac	NE	Own	4	Own	Sp	46.3	L4IH	382	185	4715	32x6	32x6D
Dodge Bros. F 60	3	2645	Own	L	6	3⅛x5	309.6	31.5	96@3000	G	Long	Borg	Cle	Sag	DL	P	DR	Own	4	Own	2 R	48.8	L4IH	416	146	5543	32x6	32x6D
*Dodge Bros. F 61	3	2575	Own	L	6	3⅛x5	309.6	31.5	96@3000	G	Long	Borg	Cle	Sag	DL	P	DR	Own	4	Own	Sp	48.8	L4IH	416	170	5789	32x6	32x6D
*Dodge Bros. F 62	3	2695	Own	L	6	3⅛x5	309.6	31.5	96@3000	G	Long	Borg	Cle	Sag	DL	P	DR	Own	4	Own	Sp	48.8	L4IH	416	195	5901	32x6	32x6D
Essex Com.	¾	445	Own	—	6	2¾x4½	——	18.2	—	—	—	—	—	——	Mar	Vac	Aut	Own	3	Own	Sp	17.8	——	—	110	1930	30x5	31x5.50
Federal D	1½	795	Con	L	4	3⅞x4¼	200.5	24.0	48@2500	C	Long	Borg	Spic	Gem	Zen	P	DR	W-G	4	Cla	Sp	40.8	L4IH	377	131	3225	20x6.00	32x6
Federal E 6	1½	895	Con	L	6	3⅜x4	215.0	27.3	60@2600	C	Long	Borg	Spic	Gem	Zen	P	DR	W-G	4	Cla	Sp	34.6	L4IH	377	132	3275	20x6.00	32x6
Federal F 7	1½	1525	Con	L	6	3⅜x4⅝	248.0	27.3	64@2500	C	Long	Borg	Pet	Gem	Zen	P	DR	Own	4	Tim	Sp	29.2	L4IH	414	132	3765	30x5	30x5D
Federal A 6	2	1855	Con	L	6	3⅜x4⅝	248.0	27.3	64@2500	C	Long	Borg	Pet	Ross	Zen	Vac	DR	Own	4	Cla	Sp	38.5	L4IH	450	151	4580	32x6	32x6D
Federal A 6 T	2½	2185	Con	L	6	3⅜x4⅝	248.0	27.3	64@2500	C	Long	Borg	Pet	Ross	Zen	Vac	DR	Own	4	Tim	Sp	41.3	L4IHV	659	151	4950	32x6	32x6D
Federal A G T W	2½	2360	Con	L	6	3⅜x4⅝	248.0	27.3	64@2500	C	Long	Borg	Pet	Ross	Zen	Vac	DR	Own	4	Tim	Wo	42.0	L4IHV	659	151	4950	32x6	32x6D
*Federal D S W	2½-3	1950	Con	L	4	3¾x4¼	200.5	24.0	48@2500	C	Long	Borg	Spic	Gem	Zen	P	DR	W-G	4	Cla	Sp	40.8	L6IH	566	140	3925	20x6.00	32x6
*Federal E G S W	2½-3	1150	Con	L	6	3⅜x4	215.0	27.3	60@2600	C	Long	Borg	Spic	Gem	Zen	P	DR	W-G	4	Cla	Sp	40.8	L6IH	566	145	3975	20x6.00	32x6
Federal T 10 B	2½-3	2740	Con	H	6	4 x4⅛	311.0	38.4	75@2200	C	Long	Borg	Pet	Ross	Zen	P	DR	Own	4	Tim	Sp	44.5	L4IHV	659	165	6550	34x7	34x7D
Federal T 10 W	2½-3	2915	Con	H	6	4 x4⅛	311.0	38.4	75@2200	C	Long	Borg	Pet	Ross	Zen	P	DR	Own	4	Tim	Wo	44.0	L4IHV	659	165	6550	34x7	34x7D
Federal T 10 D R	2½-3	2915	Con	H	6	4 x4⅛	311.0	38.4	75@2200	C	Long	Borg	Pet	Ross	Zen	P	DR	Own	4	Tim	2R	45.6	L4IHV	659	165	6550	34x7	34x7D
Federal U 6	3-3½	3360	Con	H	6	4 x4½	339.0	38.4	85@2200	C	Long	Borg	Pet	Ross	Str	P	DR	Br-L	7	Tim	Wo	64.6	L4IHV	767	165	7220	34x7	34x7D
Federal U 6 D R	3-3½	3360	Con	H	6	4 x4½	339.0	38.4	85@2200	C	Long	Borg	Pet	Ross	Str	P	DR	Br-L	7	Tim	2R	69.6	L4IHV	767	165	7220	34x7	34x7D
Federal 4 C 6 A	4-5	4735	Con	H	6	4¼x4¾	381.0	40.8	90@2200	C	Long	Borg	Pet	Ross	Zen	P	DR	Br-L	7	Tim	Wo	72.2	L4IHV	894	192	8330	36x8	36x8D
Federal 4 C 6 A D R	4-5	4735	Con	H	6	4¼x4¾	381.0	40.8	90@2200	C	Long	Borg	Pet	Ross	Zen	P	DR	Br-L	7	Tim	2R	80.6	L4IHV	894	192	8330	36x8	36x8D
Federal 4 C 6 A B	4-5	4960	Con	H	6	4¼x4¾	381.0

Major Specifications and Mechanical Details of 1931 Commercial Cars

(CONTINUED FROM PAGE EIGHT)

Make and Model	Capacity—Tons or Lbs.	Chassis Price	Engine	Valve Arr'g'm't	No. of Cyls.	Bore and Stroke	Piston Disp.	Tax H. P.	Max. Brake H. P. and Peak R. P. M.	Type Camshaft Drive	Radiator Make	Clutch Make	Universals Make	Steering Gear Make	Carburetor Make	Fuel Feed Type	Make Electr'l System	Transmission Make	No. Spds. For.	Rear Axle Make	Type Final Drive	Final Gear Reduction	Type Service Brakes	Area Service Brakes	Standard Wheel Base	Chassis Weight	Standard Tire Sizes Front	Rear
General Motors T-31	*14000	1845	Own	H	6	3 7/16 x 4 5/8	257.5	28.3	76@2500	G	Long	Own	Spic	Sag	Mar	P	DR	Mun	4	Eat	Sp	35.5	B4IM	524	141	4575	32x6P	32x6DP
General Motors T-42	*15000	1845	Buick	H	6	3 7/16 x 4 5/8	257.5	28.3	76@2500	G	Long	Own	Spic	Sag	Mar	P	DR	Mun	4	Eat	Sp	33.4	B4IM	524	141	4725	34x7P	34x7DP
General Motors T-44	*16000	2095	Buick	H	6	3 7/16 x 4 5/8	257.5	28.3	76@2500	G	Long	Own	Spic	Sag	Mar	P	DR	Mun	4	Eat	2 R	40.9	B4IM	524	141	5005	32x6P	32x6DP
General Motors T-51	*19000	2565	Own	H	6	3 3/4 x 5	331.4	33.7	94@2500	G	Long	Own	Spic	Sag	Mar	P	DR	Mun	4	Eat	Sp	40.6	B4IM	574	155	6100	34x7P	34x7DP
General Motors T-55	*19000	2690	Own	H	6	3 3/4 x 5	331.4	33.7	94@2500	G	Long	Own	Spic	Sag	Mar	P	DR	Mun	4	Eat	2 R	50.8	B4IM	574	155	6150	34x7P	34x7DP
General Motors T-60	*22000	3035	Buick	H	6	3 3/4 x 5	331.4	33.7	94@2500	G	Long	Own	Spic	Sag	Mar	P	DR	Mun	4	Tim	Wo	52.5	B4IM	702	154	6925	34x7P	34x7DP
General Motors T-61	*22000	3445	Own	H	6	3 3/4 x 5	331.4	33.7	94@2500	G	Long	Own	Spic	Sag	Str	P	DR	Mun	4	Tim	Wo	52.5	B4IMV	685	154	6925	20x9.00B	20x9.00DB
General Motors T-82	*24000	3795	Own	H	6	3 3/4 x 5	331.4	33.7	94@2500	G	Long	——	Pet	Sag	Str	P	DR	Mun	12	Tim	Wo	143.0	B4IMV	865	155	7500	20x9.00B	20x9.00DB
General Motors T-85	*26000	5600	Own	H	6	4 1/16 x 5 1/2	468.0	43.3	115@2200	G	Long	Own	Spic	Sag	Str	P	DR	Ful	4	Tim	2 R	53.3	B4IM	685	171	10350	20x9.75B	20x9.75DB
†General Motors T-90	*28000	5285	Own	H	6	3 3/4 x 5	331.4	33.7	94@2500	G	Long	Own	Pet	Sag	Str	P	DR	Mun	12	Tim	Wo	129.0	BrIA	870	185	9400	20x7.50B	20x7.50DB
†General Motors T-95	*34000	7545	Own	H	6	4 1/16 x 5 1/2	468.0	43.3	115@2200	G	Long	——	Spic	Sag	Str	P	DR	Ful	4	Tim	Wo	53.3	B6IA	—	189	13250	34x7P	34x7DP
†General Motors T-96	*34000	7195	Own	H	6	4 1/16 x 5 1/2	468.0	43.3	115@2200	G	Long	——	Spic	Sag	Str	P	DR	Ful	4	Tim	2 R	51.1	B6IA	—	189	13250	34x7P	34x7DP
Graham A X 4	1	795	Con	L	4	3 7/8 x 4	200.4	24.0	50@2800	C	Per	Jon	Blo	Ross	Til	P	Aut	W-G	4	Tim	Sp	36.3	L4JH	380	131	2900	20x6.00	20x6.50
Graham A X 6	1	895	Con	L	6	3 3/8 x 4	214.7	27.3	61@3000	C	Per	Jon	Blo	Ross	Til	P	Aut	W-G	4	Tim	Sp	36.3	L4JH	380	131	2900	20x6.00	20x6.50
Gramm B X 4	1 1/2	895	Con	L	4	3 7/8 x 4 1/4	200.4	24.0	50@2800	C	Per	Jon	Blo	Ross	Til	P	Aut	W-G	4	Tim	Sp	36.3	L4JH	380	131	3100	20x6.00	20x6.00D
Gramm B X 6	1 1/2	995	Con	L	6	3 3/8 x 4	214.7	27.3	61@3000	C	Per	Jon	Blo	Ross	Til	P	Aut	W-G	4	Tim	Sp	36.3	L4JH	380	131	3100	20x6.00	20x6.00D
Gramm B	1 3/4	1495	Lyc	L	6	3 1/4 x 4 1/2	224.0	25.3	61@2900	G	Per	Own	Blo	Ross	Zen	Vac	Aut	Cov	4	Tim	Sp	34.3	L4JH	278	140	3800	20x6.50	20x6.50D
Gramm C	2	1795	Lyc	L	6	3 5/8 x 4 1/2	278.6	31.5	82@2600	G	Per	Own	Blo	Ross	Zen	P	Aut	Cov	4	Tim	Sp	31.0	L4IH	353	160	4820	20x7.00	20x7.00D
†Gramm C X	2	1095	Con	L	4	4 1/8 x 4 1/4	227.0	27.2	55@2600	G	Per	Jon	Blo	Ross	Til	P	Aut	W-G	4	Tim	Sp	37.0	L4JH	452	131	3300	20x6.50	20x6.50D
Gramm C X	2	1295	Con	L	6	3 3/8 x 4 3/8	248.2	27.3	70@3000	C	Per	Jon	Blo	Ross	Til	P	Aut	W-G	4	Tim	Sp	37.0	L4JH	452	131	3300	20x6.50	20x6.50D
Gramm D	2 1/2	1995	Lyc	L	6	3 3/4 x 4 1/2	299.0	33.7	90@2200	G	Per	Jon	Blo	Ross	Zen	P	Aut	Cov	4	Tim	Sp	32.0	L4IHV	339	160	5100	20x7.50	20x7.50D
Gramm E	3	2595	Lyc	L	6	3 7/8 x 5	353.8	36.0	90@2200	G	Per	Own	Blo	Ross	Zen	P	Aut	Cov	4	Tim	Sp	35.0	L4IHV	659	160	5500	20x8.25	20x8.25D
Gramm E Y	3	3595	Con	H	6	4 1/16 x 4 3/4	380.8	40.8	90@2200	C	Per	Ful	Blo	Ross	Zen	P	Aut	Cov	4	Tim	Sp	30.0	L4IHV	—	190	6750	20x7.50	20x7.50D
Gramm G Y	4	4345	Con	H	6	4 3/8 x 4 3/4	428.4	45.9	100@2200	C	Per	Ful	Blo	Ross	Zen	P	Aut	Cov	4	Wis	2 R	28.0	BW4IM	—	210	7200	20x8.25	20x8.25D
Gramm G W	4	5175	Con	H	6	4 3/8 x 4 3/4	428.0	45.9	100@2200	C	Per	Ful	Blo	Ross	Zen	P	Aut	Cov	4	Wis	2 R	—	4IA	864	157	8900	20x9.00	20x9.00D
Gramm H Y	5	6545	Con	L	6	4 3/4 x 5 3/4	611.4	54.1	127@2300	G	Per	Ful	Blo	Ross	Zen	P	Aut	Ful	4	Wis	2 R	25.2	4IA	—	236	9600	36x8	36x8D
Indiana 60	*6000	995	Con	L	6	3 3/8 x 4	214.7	27.3	61@3000	C	G & O	Borg	Spic	Ross	Zen	P	Aut	W-G	3	Col	Sp	19.8	B4IM	297	132	3200	30x5	30x5
Indiana 64	6500	1195	Con	L	6	3 3/8 x 4 5/8	248.2	27.3	65@2700	C	Long	Borg	Spic	Ross	Str	Vac	Aut	Br-L	3	Col	Sp	21.3	C4IM	244	137	3400	30x5	30x5
Indiana 74	7500	1290	Con	L	6	3 3/8 x 4 5/8	248.2	27.3	65@2700	C	Long	Borg	Spic	Ross	Str	Vac	Aut	Br-L	4	Col	Sp	25.6	C4IM	190	137	3450	32x6	32x6
Indiana 80	9000	1525	Con	L	6	3 3/8 x 4 5/8	248.2	27.3	65@2700	C	Long	Borg	Spic	Ross	Str	Vac	Aut	Br-L	4	Col	Sp	20.9	C4IM	292	149	4050	32x6	32x6
Indiana 111 XW	12500	1850	Her	L	4	4 x5	251.3	25.6	46@2000	G	McC	Borg	Spic	Ross	Str	Vac	Aut	Br-L	4	Wis	2 R	35.2	K2IM	270	120	3740	32x6	32x6D
Indiana 120	12000	1990	Con	H	6	4 x4 1/8	311.0	38.4	73@2400	C	G & O	Br-L	Spic	Ross	Str	P	Aut	Br-L	4	Tim	Sp	31.3	L4IH	353	156	5200	32x6	32x6D
Indiana 140	14000	2495	Con	H	6	4 x4 1/8	311.0	38.4	73@2400	C	G & O	Br-L	Spic	Ross	Str	P	Aut	Br-L	4	Wis	2 R	35.3	L4IHV	356	156	5500	32x6	32x6D
Indiana 141	17000	2935	Con	H	6	4 x4 1/8	311.0	38.4	73@2400	C	G & O	Br-L	Spic	Ross	Str	P	Aut	Br-L	4	Wis	2 R	46.2	L4IHV	380	170	6200	32x6	32x6D
Indiana 170	17000	3160	Con	H	6	4 1/8 x 4 3/4	380.9	40.8	89@2400	C	G & O	Br-L	Spic	Ross	Str	P	Aut	Br-L	4	Wis	2 R	46.6	L4IHV	380	170	6800	32x6	32x6D
Indiana 175	17500	3660	Con	H	6	4 3/8 x 4 3/4	427.5	45.9	100@2400	C	G & O	——	Spic	Ross	Str	P	Aut	——	5	Wis	2 R	45.3	L4IHV	380	170	7200	34x7	34x7D
Indiana 195	19500	3820	Con	H	6	4 1/8 x 4 3/4	380.9	40.8	89@2400	C	G & O	Br-L	Spic	Ross	Str	P	Aut	Br-L	4	Wis	2 R	48.5	L4IHV	471	170	7300	34x7	34x7D
Indiana 190	19000	4185	Con	H	6	4 1/8 x 4 3/4	380.9	40.8	89@2400	C	Long	Borg	Spic	Ross	Str	P	Aut	Br-L	7	Tim	Wo	78.6	T2IMV	500	168½	7625	34x7	34x7D
Indiana 220	22000	4560	Con	H	6	4 3/8 x 4 3/4	427.5	45.9	100@2400	C	G & O	Br-L	Spic	Ross	Str	P	Aut	Br-L	4	Wis	2 R	50.7	L4IHV	546	170	8200	36x8	36x8D
Indiana 250	25000	5950	Con	H	6	4 3/8 x 4 3/4	427.5	45.9	100@2400	C	Long	Br-L	Spic	Ross	Str	P	Aut	Br-L	4	Tim	Wo	65.7	LT4IHV	664	182	10000	40x8	40x8D
Indiana 290	30000	7250	Con	L	6	4 3/4 x 5 3/4	611.4	54.1	116@1800	C	Long	Br-L	Spic	Ross	Str	P	L-N	Br-L	7	Tim	Wo	95.0	T4IA	676	182	10750	38x7P	40x14S
*Indiana 640	40000	9700	Con	L	6	4 3/4 x 5 3/4	611.4	54.1	116@1800	C	Long	Br-L	Spic	Ross	Str	P	L-N	Br-L	7	Tim	Wo	90.9	T4IA	864	212	14000	36x7P	36x10S
International A W 1	3/4	650	Wak	L	4	3 1/2 x 4 1/2	173.0	19.6	30@2700	G	Mod	Rock	Mec	Ross	Zen	Vac	DR	Mec	3	Own	Sp	17.4	B4IM	212	136	2620	20x5.25	20x5.25
International Sp. Del.	3/4	675	Wak	L	4	3 1/2 x 4 1/2	173.0	19.6	30@2700	G	Long	Rock	Mec	Ross	Zen	Vac	DR	Mec	3	Eat	Sp	60.3	BE4IM	256	124	2200	30x5.25	30x5.25
International 6 Sp. Spec.	1	675	Wak	L	4	3 1/2 x 4 1/2	173.0	19.6	30@2700	G	Long	Rock	Mec	Ross	Zen	Vac	DR	Mec	3	Eat	Sp	52.6	BE4IM	292	124	2430	30x5	30x5
International S 24	1 1/4	1160	Lyc	L	4	3 1/4 x 5	220.9	22.5	43@2350	G	Long	Own	Mec	Col	Zen	Vac	DR	Own	3	Eat	Sp	21.3	B4IM	346	130	3200	30x5	30x5
International S 26	1 1/4	1310	Lyc	L	6	3 1/4 x 4 1/2	224.0	25.3	61@2800	G	Long	Own	Mec	Col	Zen	Vac	DR	Own	3	Eat	Sp	21.3	B4IM	346	130	3250	30x5	30x5
International A W 2	1 1/2	675	Wak	L	4	3 1/2 x 4 1/2	173.0	19.6	30@2700	G	Long	Rock	Mec	Ross	Zen	Vac	DR	Mec	3	Own	Sp	60.3	BE4IM	492	136	2980	20x5.50	20x6.00
International S F 34	1 1/2	1450	Lyc	L	4	3 3/4 x 5	221.0	22.5	43@2350	G	Long	Own	Mec	Col	Zen	Vac	DR	Own	3	Eat	Sp	22.6	BE4IM	346	140	3520	30x5	32x6
International A L 3	1 1/2	1450	Lyc	L	6	3 1/4 x 4 1/2	224.0	25.3	61@2800	G	Mod	Own	Mec	Ross	Zen	Vac	DR	W-G	4	Own	Sp	42.9	B4IM	295	138	4360	20x6.00	20x6.00D
International S F 36	1 1/2	1600	Lyc	L	6	3 1/4 x 4 1/2	224.0	25.3	61@2800	G	Long	Own	Mec	Col	Zen	Vac	DR	Own	3	Eat	Sp	22.6	BE4IM	346	140	3570	30x5	32x6
International A 2	1 1/2	675	Wak	L	4	3 5/8 x 4 1/2	186	21.0	39@2400	G	Mod	Mec	Mec	Ross	Zen	Vac	DR	W-G	4	Own	Sp	39.5	BE4IM	212	136	2800	5.50x20	6.00x20
International B 2	1 1/2	675	Wak	L	4	3 5/8 x 4 1/2	186	21.0	39@2400	G	Mod	Mec	Mec	Ross	Zen	Vac	DR	Mec	3	Own	Sp	47.3	BE4IM	212	136	2830	5.50x20	6.00x20
International S D 44	2	1590	Lyc	L	4	3 3/4 x 5	221.5	22.5	43@2350	G	Long	Own	Mec	Col	Zen	Vac	AB	Own	4	Eat	Sp	40.6	BE4IM	421	117	3700	30x5	32x6
International S D 46	2	1740	Lyc	L	6	3 1/4 x 4 1/2	224.0	25.3	61@2800	G	Long	Own	Mec	Col	Zen	Vac	AB	Own	4	Eat	Sp	40.6	BE4IM	421	117	3750	30x5	32x6
International S F 46	2	1950	Lyc	L	6	3 1/4 x 4 1/2	224.0	25.3	61@2800	G	Long	Own	Mec	Col	Zen	Vac	DR	Own	4	Eat	Sp	40.6	BE4IM	421	140	4000	32x6	32x6D
International A 4	2	1860	Own	H	6	3 5/8 x 4 1/2	279.0	31.5	65@2800	G	Mod	Own	Mec	Ross	Zen	Vac	DR	Own	5	Own	Sp	47.8	BE4IM	378	145	5070	32x6	32x6D
International H S 54	2 1/2	3850	Hall	H	4	4 1/4 x 5 1/2	312.0	28.9	54@1800	C	Own	Own	Own	Own	Zen	Vac	RB	Own	5	Eat	2 R	60.5	BE4IM	726	148	8000	36x8	36x8S
International H S 54 C	2 1/2	3850	Hall	H	4	4 1/4 x 5 1/2	312.0	28.9	54@1800	C	Own	Own	Own	Own	Zen	Vac	RB	Own	5	Own	Ch	63.8	BO4IM	732	148	8665	36x8	36x10S
International W 1	2 1/2	3850	Hall	H	4	4 1/4 x 5 1/2	312.0	28.9	54@1800	C	Own	Own	Own	Own	Zen	Vac	RB	Own	5	Own	2 R	60.5	BE4IM	710	148	8300	36x8	36x8S
International A 5	3	2550	Own	H	6	3 5/8 x 4 1/2	279.0	31.5	65@2800	G	Mod	Own	Mec	Ross	Zen	Vac	DR	Own	5	Own	Sp	52.6	BE4IM	430	156	5606	34x7	34x7D
International A 6	3	2675	Own	H	6	3 5/8 x 4 1/2	279.0	31.5	65@2800	G	Mod	Own	Mec	Ross	Zen	Vac	DR	Own	5	Own	Sp	62.5	BE4IM	430	156	5750	34x7	34x7D
International H S 74	3 1/2	4850	Hall	H	4	4 3/4 x 5 1/2	390.0	36.1	60@1800	C	Own	Own	Own	Own	Zen	Vac	RB	Own	5	Eat	2 R	70.5	BE4IM	850	160	10700	36x8S	40x12S
International H S 74 C	3 1/2	4850	Hall	H	4	4 3/4 x 5 1/2	390.0	36.1	60@1800	C	Own	Own	Own	Own	Zen	Vac	RB	Own	5	Own	Ch	79.1	BO4IM	736	160	11000	36x8S	40x12S
International W 3	3 1/2	4850	Hall	H	4	4 3/4 x 5 1/2	390.0	36.1	60@1800	C	Own	Own	Own	Own	Zen	Vac	RB	Own	5	Own	2 R	70.5	——	—	160	10125	36x8S	40x12S
International H S 104 C	5	5500	Hall	H	4	4 3/4 x 5 1/2	390.0	36.1	60@1800	C	Own	Own	Own	Own	Zen	Vac	RB	Own	5	Own	Ch	90.5	BO4IM	736	160	11095	36x8S	40x14S
La France Rep. A 1	6000	795	Lyc	L	6	3 x 4 3/4	291.5	21.5	60@2500	G	G & O	Borg	Spic	Han	Zen	Vac	Aut	Ful	4	Tim	Sp	36.1	L4IH	—	132	3000	20x5.50	32x6
La France Rep. C 1	7500	1295	Lyc	L	6	3 1/4 x 4 1/2	224.0	25.4	61@2750	G	G & O	Borg	Spic	Han	Zen	Vac	Aut	Ful	4	Tim	Sp	29.1	L4IH	—	144	3300	20x6.00	32x6
La France Rep. D 1	9000	1595	Lyc	L	6	3 1/4 x 4 1/2	224.0	25.4	61@2750	G	G & O	Borg	Spic	Han	Zen	Vac	Aut	Ful	4	Tim	Sp	37.9	L4IH	—	144	3725	30x5	30x5D
La France Rep. F-3	13000	2395	Lyc	L	6	3 3/4 x 4 1/2	299.0	33.7	80@2500	G	Per	Ful	Spic	Han	Zen	Vac	Aut	Ful	4	Tim	Sp	40.1	L4IHV	—	174	5520	34x7	34x7
La France Rep. H 2	16000	2985	Lyc	L	6	3 7/8 x 5	354.0	36.0	85@2300	G	Per	Ful	Spic	Han	Zen	Vac	Aut	Ful	4	Wis	2 R	41.6	L4IHV	—	174	6370	34x7	34x7D
La France Rep. M 2	20000	4000	Wak	L	6	4 3/8 x 5 1/2	462.0	46.0	97@2000	G	Per	Ful	Spic	Han	Zen	Vac	Aut	Ful	5	Wis	2 R	48.1	L4IHV	—	174	7500	36x8	36x8D
La France Rep. 35-2	24000	5600	Wak	L	6	4 1/2 x 5 3/4	549.0	48.6	98@1850	G	Own	Ful	Spic	Han	Zen	Vac	Aut	Ful	4	Wis	2 R	45.4	L4IHV	—	174	9250	38x9	38x9D
Macear 36 A	1 1/2	1900	Bud	L	6	3 3/4 x 4 1/2	298.0	33.7	83@2800	G	Per	Br-L	Spic	Ross	Str	P	DR	Br-L	4	Tim	Sp	31.1	L4W	315	171	4850	32x6	32x6D
Macear 40 A	2	2400	Bud	L	6	3 3/4 x 4 1/2	298.0	33.7	83@2800	G	Per	Br-L	Spic	Ross	Str	P	DR	Br-L	4	Tim	Sp	40.6	L4W	365	171	5340	32x6	32x6D
Macear 56	3	3350	Bud	L	6	3 3/4 x 5	311.0	33.7	72@2100	G	Per	Br-L	Spic	Ross	Str	Vac	DR	Br-L	4	Wis	2R	34.5	L4W	380	183	6200	34x7	34x7D
Macear 60	3	3950	Bud	L	6	4 1/16 x 5 1/8	411.0	40.8	103@2100	G	Per	Br-L	Spic	Ross	Str	Vac	DR	Br-L	5	Tim	Wo	37.2	L4W	375.5	183	6660	20x9.00	20x9.00D
Macear 86 A	4	5500	Her	L	6	4 3/8 x 4 3/4	479.0	51.3	106@2100	G	Per	Br-L	Spic	Ross	Zen	Vac	DR	Br-L	7	Tim	Wo	86.7	4 A	617.5	206	8200	20x9.75	20x9.75D
Macear 86 A	5	5950	Her	L	6	4 3/8 x 4 3/4	479.0	51.3	106@2100	G	Per	Br-L	Spic	Ross	Zen	Vac	DR	Br-L	7	Tim	Wo	85.0	4 A	623	206	9500	20x10.50	20x10.50D
Mack B L	1 1/2	2500	Own	L	6	3 1/4 x 5	248.9	25.3	63@2800	G	Own	Own	Spic	Gem	Str	Vac	NE	Own	4	Tim	Sp	Opt	L4IH	302	148	——	20x6.00B	20x6.00DB
††Mack B G	2	3000	Own	L	6	3 5/8 x 5	309.6	31.5	75@2600	G	Own	Own	Spic	Own	Str	Vac	NE	Own	4	Own	Sp	Opt	O4IV	415	156	——	32x6	32x6D
Mack B F	2 1/2	3950	Own	L	6	3 5/8 x 5	309.6	31.5	75@2600	G	Own	Own	Spic	Own	Str	Vac	RB	Own	4	Own	Sp	Opt	O4IV	450	2-Opt	——	8.25x20B	8.25x20DB
Mack A B	2 1/2-3	4350	Own	L	4	4 1/4 x 5	283.7	28.9	60@2200	G	Own	Own	Spic	Own	Str	Gra	NE	Own	4	Own	2R	Opt	O4IV	471	2-Opt	——	34x7	34x7D
††Mack A B	2 1/2-3	4000	Own	L	4	4 1/4 x 5	283.7	28.9	60@2200	G	Own	Own	Spic	Own	Str	Vac	NE	Own	4	Own	Ch	Opt	O4IV	471	2-Opt	——	34x7	34x7D
Mack A B	2 1/2-3	4500	Own	L	6	3 5/8 x 5	309.6	31.5	75@2600	G	Own	Own	Spic	Own	Str	Gra	NE	Own	4	Own	2R	Opt	O4IV	471	2-Opt	——	34x7	34x7D
††Mack A B	2 1/2-3	4150	Own	L	6	3 5/8 x 5	309.6	31.5	75@2600	G	Own	Own	Spic	Own	Str	Vac	NE	Own	4	Own	Ch	Opt	O4IV	471	2-Opt	——	34x7	34x7D
††Mack B C	3-4	5250	Own	L	6	4 x 5 1/2	417.7	38.4	100@2300	G	Own	Own	Spic	Own	Str	Vac	NE	Own	4	Own	2R	Opt	O4IV	610	2-Opt	——	36x8	36x8D
††Mack B C	3 1/2-5	5500	Own	L	6	4 x 5 1/2	417.7	38.4	100@2300	G	Own	Own	Spic	Own	Str	Vac	NE	Own	4	Own	Ch	Opt	O4IV	610	2-Opt	——	36x8	36x8D
††Mack B J	3 1/2-5	6150	Own	L	6	4 1/2 x 5 1/2	525.2	48.6	126@2200	G	Own	Own	Spic	Own	Str	Vac	L-N	Own	4	Own	2R	Opt	O4IV	567	3-Opt	——	36x8	36x8D
††Mack A K	3 1/2-5	5150	Own	L	4	5 x 6	471.2	40.0	77@1800	G	Own	Own	Spic	Own	Str	Gra	RB	Own	4	Own	Ch	Opt	O4IV	492	3-Opt	——	36x8S	36x8DS
††Mack A K	3 1/2-5	5250	Own	L	4	5 x 6	471.2	40.0	77@1800	G	Own	Own	Spic	Own	Str	Gra	RB	Own	4	Own	2R	Opt	O4IV	492	3-Opt	——	36x8S	36x8DS
††Mack A C	3 1/2-5	4950	Own	L	4	5 x 6	471.2	40.0	77@1800	G	Own	Own	Spic	Own	Str	Gra	RB	Own	4	Own	Ch	Opt	OJXM	194	3-Opt	——	36x8S	40x8DS
††Mack A K	3 1/2-5	6450	Own	L	6	4 1/2 x 5 1/2	525.5	48.6	126@2200	G	Own	Own	Spic	Han	Str	Vac	L-N	Own	4	Own	2R	Opt	O4IV	492	3-Opt	——	22x10.50B	22x10.50DB
††Mack A C	5 1/2-7	5500	Own	L	4	5 x 6	471.2	40.0	77@1800	G	Own	Own	Spic	Own	Str	Gra	RB	Own	4	Own	Ch	Opt	OJXM	194	3-Opt	——	36x8S	40x8DS
††Mack A C	5 1/2-7	6550	Own	L	6	4 1/2 x 5 1/2	525.5	48.6	126@2200	G	Own	Own	Spic	Han	Str	Vac	L-N	Own	4	Own	Ch	Opt	O4IV	492	3-Opt	——	24x10.50B	24x10.50DB
††Mack A C	7 1/2	6000	Own	L	4	5 x 6	471.2	40.0	77@1800	G	Own	Own	Spic	Own	Str	Gra	RB	Own	4	Own	Ch	Opt	OJXM	194	3-Opt	——	36x7S	40x7DS
††Mack A P	7 1/2	9500	Own	L	6	5 x 6	706.5	60.0	150@2000	G	Own	Own	Spic	Own	Str	Gra	NE	Own	4	Own	Ch	Opt	O2IV	287	191	——	36x7S	40x8DS
Mack A K 6—6 wheel	——	9500	Own	L	6	4 1/2 x 5 1/2	525.2	48.6	126@2200	G	Own	Own	Spic	Own	Str	Vac	L-N	Own	4	Own	Ch	Opt	ORIV	574	3-Opt	——	9.75x22B	9.75x22DB
††Mack A C 6 wheel	10	7500	Own	L	4	5 x 6	471.2	40.0	77@1800	G	Own	Own	Spic	Own	Str	Gra	RB	Own	4	Own	Ch	Opt	ORIV	574	3-Opt	——	36x6S	40x12S
Mack A C 6—6 wheel	——	8700	Own	L	6	4 1/2 x 5 1/2	525.2	48.6	126@2200	G	Own	Own	Spic	Own	Str	Vac	L-N	Own	4	Own	Ch	Opt	ORIV	574	3-Opt	——	9.75x22B	9.75x22DB
††Mack A P 6 wheel	10	12000	Own	L	6	5 x 6	706.5	60.0	150@2000	G	Own	Own	Spic	Own	Str	Gra	NE	Own	4	Own	Ch	Opt	O2IV	574	3-Opt	——	36x7S	40x12S
Paige	1/2	*895	Own	L	6	3 1/8 x 4 1/2	224	23.4	70@3200	C	Long	Long	Un	Ross	DL	P	DR	—	3	——	Sp	14.2	4IH	187	115	——	18x5.50B	18x5.50B
Pierce-Arrow P T	2	2950	Own	L	6	3 3/4 x 4 1/2	298.0	33.5	70@2600	G	Long	Long	Cle	Han	Zen	P	DR	Cla	4	Tim	Sp	——	B4IMV	388	160	5600	20x7.50B	20x7.50B
Pierce-Arrow P W	3	4150	Own	L	6	4 1/4 x 4 1/2	361.0	40.3	77@2400	G	Long	Long	Cle	Han	Zen	P	DR	Cov	4	Tim	*Wo	——	W4IA	488	150	6060	20x9.00B	20x9.00B
Pierce-Arrow P X	4	5375	Own	L	6	4 5/8 x 4 3/4	479.0	51.3	103@2200	G	Long	Long	Cle	Han	Zen	P	DR	Cov	4	Tim	*Wo	——	W4IA	610	160	9300	20x10.50B	20x10.50B
Pierce-Arrow P Y	5	5950	Own	L	6	4 5/8 x 4 3/4	479.0	51.3	103@2200	G	Long	Long	Cle	Han	Zen	P	DR	Cov	4	Own	*Wo	——	W4IA	701	160	10675	24x10.50B	24x10.50B
Pierce-Arrow P Z	8	6950	Own	L	6	4 3/4 x 5 3/4	611.0	54.1	130@2000	G	Long	Long	Cle	Han	Zen	P	DR	Own	4	Own	*Wo	——	W4IA	702	168	12800	36x7B	40x16B
Relay Series 15 AA	3/4	1370	Con	L	6	3 3/8 x 4	214.7	27.3	52@2200	C	Long	Borg	Blo	Han	Str	Vac	Aut	W-G	4	Own	2R	38.4	L4IH	297	131	3750	30x5P	30x5P
Relay Series 15 AB	1	1400	Con	L	6	3 3/8 x 4	214.7	27.3	52@2200	C	Long	Borg	Blo	Han	Zen	Vac	Aut	W-G	4

Major Specifications and Mechanical Details of 1931 Commercial Cars

(CONTINUED FROM PAGE NINE)

Make and Model	Capacity—Tons or Lbs.	Chassis Price	Engine	Valve Arr'g'm't	No. of Cyls.	Bore and Stroke	Piston Disp.	Tax H. P.	Max. Brake H. P. and Peak R. P. M.	Type Camshaft Drive	Radiator Make	Clutch Make	Universals Make	Steering Gear Make	Carburetor Make	Fuel Feed Type	Make Electr'l System	Make Transmission	No. Spds. For.	Rear Axle Make	Type Final Drive	Final Gear Reduction	Type Service Brakes	Area Service Brakes	Standard Wheel Base	Chassis Weight	Standard Tire Sizes Front	Standard Tire Sizes Rear
Selden 67 C	5	4975	Con	H	6	4⅜x4¾	427.0	45.9	100@2400	C	Own	Br-L	Spic	Ross	Str	Vac	Aut	Br-L	7	Wis	2R	——	L4IHVA	—	171	8700	36x8	36x8D
Selden 77	7	7365	Con	L	6	4¼x5⅜	611.0	54.1	127@2300	G	Own	Br-L	Spic	Ross	Str	Vac	Aut	Br-L	7	Wis	2R	——	BW4IM	—	178	11600	40x8	42x9D
Service Series S 11	1	1600	Bud	L	6	3⅜x4½	241.6	27.3	53@2200	G	Long	Br-L	Blo	Han	Zen	Vac	Aut	Br-L	4	Col	Sp	25.5	——	—	142	3900	30x5P	30x5P
Service Series S 11	1½	1900	Bud	L	6	3⅜x4½	241.6	27.3	53@2200	G	Long	Br-L	Blo	Han	Zen	Vac	Aut	Br-L	4	Tim	Sp	29.2	L4IH	297	162	4300	30x5P	30x5DP
Service Series 40	1½	2990	Bud	L	6	3⅜x5	309.6	31.5	64@2100	G	Long	Br-L	Blo	Han	Zen	Vac	Aut	Br-L	4	Tim	Wo	34.8	L4IH	394	168	4700	34x5P	34x5DP
Service Series S 11	2	2030	Bud	L	6	3⅜x4½	241.6	27.3	53@2200	G	Long	Br-L	Blo	Han	Zen	Vac	Aut	Br-L	4	Tim	Sp	29.2	L4IH	297	162	4500	32x6	32x6D
Service Series 40	2	3240	Bud	L	6	3⅜x5	309.6	31.5	64@2100	G	Long	Br-L	Blo	Han	Zen	Vac	Aut	Br-L	4	Tim	Wo	34.8	L4IH	394	168	4900	36x6	36x6D
Service Series 40	2½	3240	Bud	L	6	3⅜x5	309.6	31.5	64@2100	G	Long	Br-L	Blo	Han	Zen	Vac	Aut	Br-L	4	Tim	Wo	34.8	L4IH	394	168	5100	36x6P	36x6D
Service Series 60	2½	4580	Bud	L	6	4⅛x5⅛	410.9	40.8	83@2100	G	Long	Ful	Blo	Han	Zen	Vac	Aut	Ful	5	Tim	Wo	63.0	L4IH	584	175	7000	36x8	36x6D
Service Series 60	3	4680	Bud	L	6	4⅛x5⅛	410.9	40.8	83@2100	G	Long	Ful	Blo	Han	Zen	Vac	Aut	Ful	5	Tim	Wo	63.0	——	—	175	7100	36x6	38x7D
Service Series 80	3½	5250	Bud	L	6	4⅛x5⅛	411.0	40.8	83@2100	G	Long	Borg	Blo	Ross	Zen	Vac	Aut	Br-L	7	Tim	Wo	98.2	——	—	175	8200	36x6S	36x12S
Service Series 80	4	5330	Bud	L	6	4⅛x5⅛	411.0	40.8	83@2100	G	Long	Own	Blo	Ross	Zen	Vac	Aut	Br-L	7	Tim	Wo	98.2	——	—	175	8400	36x6S	36x14S
Service Series 100	5	5830	Bud	L	6	4⅛x5⅛	410.9	40.8	83@2100	G	Long	Own	Blo	Ross	Zen	Vac	Aut	Br-L	7	Tim	Wo	95.0	——	—	175	9600	36x6S	40x14S
Stewart 30	1	695	Lyc	L	4	3⅜x4½	199.0	22.5	50@2600	G	Fed	Borg	Spic	Ross	Str	P	DR	W-G	4	Sal	Sp	35.1	B4IM	—	130	2977	20x6.50	20x6.50
Stewart 30X	1	795	Lyc	L	6	3 x4¼	185.0	19.8	55@2600	G	Fed	Borg	Spic	Ross	Str	P	DR	W-G	4	Sal	Sp	35.1	B4IM	—	130	3018	20x6.50	20x6.50
Stewart 40	1½	895	Lyc	L	4	3⅜x4½	199.0	22.5	50@2600	G	Fed	Borg	Spic	Ross	Str	P	DR	W-G	4	Cla	Sp	35.1	B4IM	—	130	3350	20x6.50	20x6.50D
Stewart 40 X	1½	995	Lyc	L	6	3 x4½	201.5	23.8	60@2800	G	Fed	Borg	Spic	Ross	Str	P	DR	W-G	4	Sal	Sp	35.1	B4IM	—	130	3393	20x6.50	20x6.50D
Stewart 34 X	1½	1195	Lyc	L	6	3⅛x4½	224.0	25.3	61@2600	G	Own	Borg	Spic	Ross	Str	P	DR	W-G	4	Cla	Sp	35.1	B4IM	—	145	3710	20x6.50	20x6.50D
Stewart 28X	2	1495	Lyc	L	6	3⅛x4½	224.0	25.3	61@2600	G	Own	Ful	Spic	Ross	Str	P	DR	Ful	4	Cla	Sp	44.1	B4IM	—	130	4058	20x6.50	20x6.50D
Stewart 29 X S	2	1695	Lyc	L	6	3⅛x4½	224.0	25.3	85@2750	G	Own	Ful	Spic	Ross	Str	P	DR	Ful	4	Cla	Sp	44.1	B4IM	—	145	4960	32x6	32x6D
*Stewart 18 X	2½	2690	Lyc	L	6	3⅞x5	310.0	31.5	85@2750	G	Own	Ful	Spic	Ross	Str	P	DR	Ful	4	Tim	Wo	48.1	B4IM	—	165	5901	32x6	32x6D
Stewart 32 X	2½	1990	Lyc	L	6	3⅜x4½	278.0	31.5	80@2500	G	Mod	Ful	Spic	Ross	Str	P	DR	Ful	4	Cla	Sp	46.1	B4IM	—	165	5230	32x6	32x6D
Stewart 35 X	3	2590	Lyc	L	6	3⅞x4½	299.0	33.8	85@2750	G	Fed	Ful	Spic	Ross	Str	P	DR	Ful	4	Cla	Sp	46.1	B4IM	—	165	5880	20x8.25B	20x8.25D
Stewart 36 X	3	2990	Lyc	L	6	3⅞x5	354.0	36.2	90@2750	G	Fed	—	Spic	Ross	Str	P	DR	Br-L	4	Tim	Wo	105.1	——	—	165	6500	20x8.25	20x8.25D
Stewart 38-8	3½	3990	Lyc	L	8	3⅜x4⅜	462.0	44.4	130@2800	G	Fed	—	Spic	Ross	Str	P	DR	Br-L	12	Tim	2R	105.1	——	—	170	7600	20x9.00	20x9.00D
Stewart 38-6	3½	3990	Wak	L	6	4⅜x5⅛	420.0	45.9	100@2000	G	Fed	—	Spic	Ross	Str	P	DR	Br-L	12	Tim	2R	105.1	——	—	170	7600	20x9.00	20x9.00D
Stewart 19 X	3½	3690	Lyc	L	6	3⅞x5	354.0	36.2	90@2750	G	Mod	Ful	Spic	Ross	Str	P	DR	Ful	12	Tim	Wo	105.1	B4IM	—	165	7110	34x7	34x7D
Stewart 31 X	5	4990	Wak	L	6	4⅜x5⅛	462.0	45.9	100@2000	G	Mod	Ful	Spic	Ross	Str	P	DR	Ful	8	Tim	Wo	105.1	B4IMV	—	165	9340	36x6S	36x6SD
Stewart 27 X	7	5700	Wak	L	6	4⅜x5⅛	462.0	45.9	100@2000	G	Own	Ful	Spic	Ross	Str	P	DR	Ful	8	Tim	Wo	105.1	B4IMV	—	165	9987	36x7	40x7D
Studebaker S-1	½	595	Own	L	6	3⅛x4⅛	221.0	27.3	70@3200	C	McC	Long	Spic	Ross	Str	P	DR	W-G	3	Own	Sp	16.4	B4IM	148	114	2330	19x5.25	19x5.25
Studebaker S-20	1½	695	Own	L	6	3⅛x4⅛	205.0	25.4	70@3200	C	McC	Long	Spic	Ross	Str	P	DR	W-G	4	Tim	Sp	36.2	B4IM	224	130	2985	20x6.00	32x6
Studebaker S-30	1½	775	Own	L	6	3⅛x4⅛	205.0	25.4	70@3200	C	McC	Long	Spic	Ross	Str	P	DR	W-G	4	Tim	Sp	36.2	B4IM	224	160	3140	20x6.00	32x6
Studebaker S-40	2	945	Own	L	6	3⅛x4⅛	205.0	25.4	70@3200	C	McC	Long	Spic	Ross	Str	P	DR	W-G	4	Tim	Sp	37.4	B4IM	276	136	3775	20x6.50	20x6.50D
Studebaker S-50	2	895	Own	L	6	3⅛x4⅛	205.0	25.4	70@3200	C	McC	Long	Cle	Ross	Str	P	DR	W-G	4	Tim	Sp	37.4	B4IM	276	148	3810	20x6.50	20x6.50D
Studebaker S-60	2	945	Own	L	6	3⅛x4⅛	205.0	25.4	70@3200	C	McC	Long	Cle	Ross	Str	P	DR	W-G	4	Tim	Sp	37.4	B4IM	276	148	3265	20x6.50	20x6.50D
Studebaker GN-S	——	1245	Own	L	6	3⅜x4⅛	221.0	27.3	70@3200	C	—	Long	—	Ross	Str	P	DR	Cla	4	Cla	Sp	33.5	B4IM	348	160	3850	30x5	32x6
Studebaker 88	——	3295	Own	L	8	3½x4⅜	337.0	39.2	115@3200	G	Long	Long	Spic	Ross	Str	P	DR	Ful	4	Eat	Sp	24.6	B4IMV	444	184	5200	20x7.50	20x7.50D
Studebaker 99	——	3795	Own	L	8	3½x4⅜	337.0	39.2	115@3200	G	Long	Long	Spic	Ross	Str	P	DR	Ful	4	Eat	Sp	24.6	B4IMV	505	184	5680	20x7.50	20x7.50D
White 15B	*7,500	1545	Own	L	4	3¾x5⅛	226.4	22.5	31@1600	G	Own	Own	Spic	Own	Zen	Vac	L-N	Own	4	Own	Sp	18.6	O2XM	226	133½	3402	30x5	30x5
White 160	*8,000	1700	Own	L	4	4 x5⅜	289.0	25.6	45@1800	G	—	Own	Mec	Han	Zen	Vac	DR	Own	4	Own	Sp	19.5	L4IH	276	138	4025	30x5	30x5
White 60	*8,000	1850	Own	L	6	3½x4½	260.0	29.4	54@2100	C	Own	Own	Mec	Han	Zen	Vac	DR	Own	3	Own	Sp	17.8	L4IH	276	138	3739	30x5	30x5D
White 161	*9,000	1850	Own	L	4	4 x5⅜	289.0	25.6	45@1800	G	—	Own	Mec	Han	Zen	Vac	DR	Own	4	Own	Sp	19.5	L4IH	276	138	4290	34x7	34x7
White 162	*10,000	1900	Own	L	4	4 x5⅜	289.0	25.6	45@1800	G	—	Own	Mec	Han	Zen	Vac	DR	Own	4	Own	Sp	19.5	L4IH	276	138	4260	30x5	30x5D
White 210	*10,000	2300	Own	L	4	4 x5⅜	289.0	25.6	45@1800	G	—	Own	Spic	Han	Zen	Vac	DR	Own	4	Own	Sp	23.4	L4IH	349	148	4875	30x5	30x5D
White 61	*10,500	2450	Own	L	6	3¾x4½	299.0	33.7	61@2100	C	Own	Own	Spic	Han	Zen	Vac	DR	Own	4	Own	Sp	23.4	L4IH	349	148	4789	30x5	30x5D
White 611	*11,500	2550	Own	L	6	3¾x4½	299.0	33.7	61@2100	C	—	Own	—	Han	Zen	Vac	DR	Own	4	Own	Sp	23.4	L4IH	349	148	4980	20x7.00B	20x7.00DB
White 211	*11,500	2425	Own	L	4	4 x5⅜	289.0	25.6	45@1800	G	—	Own	Spic	Han	Zen	Vac	DR	Own	4	Own	Sp	23.4	L4IH	349	148	5110	32x6	32x6D
White 212	*13,000	2700	Own	L	4	4 x5⅜	289.0	25.6	45@1800	G	—	Own	Spic	Han	Zen	Vac	DR	Own	4	Own	Sp	23.4	L4IH	349	148	5230	34x7	34x7D
White 56	*13,000	3125	Own	L	4	4 x5⅜	289.0	25.6	45@1600	G	Own	Own	Spic	Own	Zen	Vac	Eis	Own	4	Own	Sp	26.2	O2IM	268	165	5276	36x4	36x7
White 612	*13,000	2800	Own	L	6	3¾x4½	299.0	3.7	61@2100	C	—	Own	—	Han	Zen	Vac	DR	Own	4	Own	Sp	23.4	L4IH	349	148	5100	20x7.50B	20x7.50DB
White 620	*15,000	4350	Own	H	6	4 x5⅛	396.0	38.4	72@1800	G	Own	Own	Spic	Ross	Zen	P	DR	Own	4	Own	Sp	41.8	OL4IHV	—	157	7300	20x8.25B	20x8.25DB
White 51A	*17,000	3750	Own	L	4	4¼x5⅜	326.0	28.9	54@1600	G	Own	Own	Spic	Own	Zen	Vac	Eis	Own	4	Own	Sp	35.6	O2IM	335	170	6438	36x5	36x8
White 51AT	*17,000	3875	Own	L	4	4¼x5⅜	326.0	28.9	54@1600	G	Own	Own	Spic	Own	Zen	Vac	Eis	Own	4	Own	Sp	46.6	O2IM	335	134	6227	36x5	36x8
White 621	*18,000	4650	Own	H	6	4 x5¼	396.0	38.4	72@1800	C	Own	Own	Spic	Ross	Zen	P	DR	Own	4	Own	Sp	41.4	OL4IHV	—	157	7700	20x9.00B	20x9.00DB
White 640	*20,000	6100	Own	H	6	4⅜x5⅜	519.0	45.9	96@1800	C	Own	Own	Spic	Ross	Zen	P	L-N	Own	4	Own	Sp	33.9	O4IA	—	180	9200	20x9.00B	20x9.00DB
White 630	*20,000	5000	Own	H	6	4 x5¼	396.0	38.4	72@1800	C	—	Own	Spic	Ross	Zen	P	DR	Own	4	Own	Sp	41.4	O4IHV	554	168	8500	20x9.00B	20x9.00DB
White 55	*21,500	4650	Own	L	4	4¼x5⅜	326.0	28.9	54@1600	G	Own	Own	Spic	Own	Zen	Vac	Eis	Own	4	Own	2R	66.1	OPXM	224	174	8737	36x5	40x5D
White 58	*22,000	4400	Own	L	4	4¼x5⅜	326.0	28.9	54@1600	G	Own	Own	Spic	Own	Zen	Vac	Eis	Own	4	Own	2R	49.7	OPXM	224	180	7797	36x5	36x5D
White 641	*24,000	6450	Own	H	6	4⅜x5⅜	519.0	45.9	96@1800	C	Own	Own	Spic	Ross	Zen	P	L-N	Own	4	Own	2R	46.9	O4IA	—	180	9700	20x9.75B	20x9.75DB
*White 650 SW200	*24,000	6280	Own	H	6	4 x5¼	396.0	38.4	72@1800	C	—	Own	Spic	Ross	Zen	P	DR	Own	4	TIM	WQ	44.2	OTIHV	—	193	10000	20x8.25B	20x8.25DB
White 651	*24,000	5750	Own	H	6	4 x5¼	396.0	38.4	72@1800	C	Own	Own	Spic	Ross	Zen	P	DR	Own	4	Own	2R	56.9	OTIHV	—	168	9000	20x9.25B	20x9.25DB
White 52	*28,000	5100	Own	L	4	4¼x5⅜	326.0	28.9	54@1600	G	Own	Own	Spic	Own	Zen	Vac	Eis	Own	4	Own	2R	58.4	OPXM	224	174	9409	36x6	40x12
White 52T	*28,000	4700	Own	L	4	4¼x5⅜	326.0	28.9	54@1600	G	Own	Own	Spic	Own	Zen	Vac	Eis	Own	4	Own	2R	76.5	OPXM	224	129½	8461	36x5	40x5D
White 643	*32,000	6950	Own	H	6	4⅜x5⅜	519.0	45.9	96@1800	C	Own	Own	Spic	Ross	Zen	P	L-N	Own	4	Own	2R	66.5	O4IA	—	180	10900	24x10.50B	24x10.50DB
*White 642 SW310	*34,000	8045	Own	H	6	4⅜x5⅜	519.0	45.9	96@1800	C	—	Own	Spic	Ross	Zen	P	L-N	Own	4	TIM	WO	55.6	OTIHV	—	198	12670	20x9.00B	20x9.00DB
White 642	*34,000	6750	Own	H	6	4⅜x5⅜	519.0	45.9	96@1800	C	Own	Own	Spic	Ross	Zen	P	L-N	Own	4	Own	2R	66.5	O4IA	—	180	10600	24x9.75B	24x9.75DB
*White 643 SW110	*40,000	8570	Own	H	6	4⅜x5⅜	519.0	45.9	96@1800	C	—	Own	Spic	Ross	Zen	P	L-N	Own	4	TIM	WO	69.9	OTIHV	—	198	14400	40x8	40x8D
**White 60K	——	2200	Own	L	6	3½x4½	260.0	29.4	54@2100	C	—	Own	MEC	Han	Zen	Vac	DR	Own	3	Own	Sp	17.6	L4IH	276	112	5200	20x7.00B	20x7.00B
White 601	——	1900	Own	L	6	3½x4½	260.0	29.4	54@2100	C	—	Own	MEC	Han	Zen	Vac	DR	Own	4	Own	Sp	19.5	L4IH	276	138	3825	20x7.00B	20x7.00B
White 602	——	2050	Own	L	6	3½x4½	260.0	29.4	50@1800	C	—	Own	MEC	Han	Zen	Vac	DR	Own	4	Own	Sp	19.5	L4IH	276	138	4125	20x7.50B	20x7.50B
Willys 6-C-113	½	395	Own	L	6	3⅛x3⅞	193.0	25.3	65@3400	C	Fed	Borg	Spic	Own	Til	P	Aut	Own	3	Own	Sp	12.4	B4IM	147	113	1872	19x5.00	19x5.00
Willys 6-C-131	1½	595	Own	L	6	3⅛x3⅞	193.0	25.3	65@3400	C	Fed	Borg	Spic	Own	Til	P	Aut	W-G	4	Cla	Sp	40.8	B4IM	232	131	2625	20x5.50	32x6
Willys 6 C-157	1½	630	Own	L	6	3⅛x3⅞	193.0	25.3	65@3400	C	Fed	Borg	Spic	Own	Til	P	Aut	W-G	4	Cla	Sp	40.8	B4IM	232	157	2900	20x5.50	32x6

GENERAL NOTATIONS

*†REFERENCE MARKS apply to individual lines only and explanations are given under the subdivision for each company in the "SPECIAL NOTATIONS."

CAPACITIES given in this table are in tons or fractions of tons. *Shows maximum allowable gross weight in pounds.

WHEEL BASES given are standard, but optional wheel bases are available in many cases.

ENGINE—Bud, Buda; Con, Continental; Her, Hercules; Lyc, Lycoming; Pont, Pontiac; Wak, Waukesha; Wis, Wisconsin; Hall, American Car & Foundry.

VALVE ARRANGEMENT—L, "L" head; H, in head; O, overhead; T, T head.

TYPE OF CAMSHAFT DRIVE—G, gear; C, chain.

RADIATOR MAKE—G & O, G & O Mfg. Co.; Per, Perfex Corp.; Long, Long Mfg. Co.; Har, Harrison Radiator Corp.; Fed, Fedders Mfg. Co.; McC, McCord Radiator & Mfg. Co.; Mod, Modine Mfg. Co.; Hex, Hexel Radiator Co.

CLUTCH MAKE—Jon, Jones Clutch & Gear Co.; Ful, Fuller & Sons Mfg. Co.; Borg, Borg & Beck Co.; Br-L, Brown Lipe Gear Co.; Rock, Rockford Drill & Machine Co.; Cov, Covert Gear Co.; Long, Long Mfg. Co.; Detr, Detroit Gear & Machine Co.; Mer, Merchant & Evans; Hel, Merchants & Evans.

UNIVERSALS MAKE—Spic, Spicer Mfg. Co.; Blo, Blood Bros. Machine Co.; Sup, Superior Universal Products; Un, Universal Products Co.; Cle, Cleveland Steel Products Corp.; Pet, Peters; Opt, optional; Mec, Mechanics Machine Co.

STEERING GEAR MAKE—Ross, Ross Gear & Tool Co.; Han, Hannum Mfg. Co.; Sag, Saginaw Steering Gear Co.; Gem, Gemmer Mfg. Co.; Col, Columbus Gear & Pump Co.; W-G, Warner Gear Corp.

CARBURETOR—Car, Carter; Mar, Marvel; Sch, Wheeler-Schebler; Str, Stromberg; DL, Detroit Lubricator; Til, Tillotson; Zen, Zenith-Detroit.

FUEL FEED—Gra, gravity; Vac, vacuum tank; P, fuel pump.

ELECTRICAL SYSTEM—AB, American-Bosch; Aut, Electric Auto-Lite; Eis, Eisemann; L-N, Leece-Neville; NE, North East; RB, Robert Bosch; DR, Delco-Remy.

TRANSMISSION—Br-L, Brown-Lipe; Cov, Covert; Ful, Fuller; Mec, Mechanics Machine; Mun, Muncie; W-G, Warner Gear; Cot, Cotta Gear Co.; Cla, Clark Equipment Co.

REAR AXLE—Cla, Clark Equipment; Col, Columbia; Eat, Eaton; Pont, Pontiac; Sal, Salisbury; Tim, Timken; Wis, Wisconsin.

FINAL DRIVE—IG, internal gear; St, straight bevel; Sp, spiral bevel; Wo, worm; 2R, double reduction; Ch, chain; S-T, semi-transverse.

TIRES—B, balloon; D, dual; S, solid; P, pneumatic.

TYPE OF SERVICE BRAKES—B4IM, Bendix, 4 wheel internal mechanical; B6IA, Bendix, 6 wheel, internal air; B4IMV, Bendix, 4 wheel, internal mechanical, vacuum; BrIA, Bendix operating on 4 rear wheels, internal, air; BW4IM, Bendix front, Wisconsin rear, 4 wheel internal, mechanical; BE4IM, Bendix front, Eaton rear, 4 wheel, internal mechanical; BO4IM, Bendix front, own rear, 4 wheel internal mechanical; B4IH, Bendix, 4 wheel, internal, hydraulic; B4, Bendix, 4 wheel.

C4IM, Columbia, 4 wheel, internal, mechanical; K2IM, Clark, 2 wheel, internal, mechanical.

L4IHVA, Lockheed, 4 wheel, internal, hydraulic, vacuum, air; LO4ID, Lockheed, own, 4 wheel, internal, drive shaft; LT4DV, Lockheed Timken, 4 wheel, drive shaft, vacuum; L4IH, Lockheed, 4 wheel, internal, hydraulic; L4IHV, Lockheed, 4 wheel, internal, hydraulic, vacuum; LT4IVA, Lockheed, Timken, 4 wheel, internal, vacuum, air; L6IHV, Lockheed, 6 wheel, internal, hydraulic, vacuum; L6IH, Lockheed, 6 wheel, internal, hydraulic.

O2IM, Own, 2 wheel, internal, mechanical; O2IV, Own, 2 wheel, internal, vacuum; O4IA, Own, 4 wheel, internal, air; O4IM, Own, 4 wheel, internal, mechanical; O4IV, Own 4 wheel, internal, vacuum; O4M, Own, 4 wheel, mechanical; O2XM, Own, 2 wheel, external, mechanical; O4XM, Own, 4 wheel, external, mechanical; OJXM, Own, jack shaft, external, mechanical; OL4IH, Own, Lockheed, 4 wheel, internal, hydraulic; OPX, Own, propeller shaft, external; OPXM, Own, propeller shaft, external, mechanical; OPM, Own, propeller shaft, mechanical; ORIV, Own, rear wheels, internal vacuum.

S4IM Steeldraulic, 4 wheel, internal, mechanical.

T4rIA, Timken, operating on 4 rear wheels, internal, air; T4IA, Timken, 4 wheel, internal, air; T6IA, Timken, 6 wheel, internal, air; T2IMV, Timken, 2 wheel internal, mechanical, vacuum.

W4I, Westinghouse, 4 wheel, internal; W4IA, Westinghouse, 4 wheel, internal, air.

4IA, Four wheel, internal, air; 4IH, Four wheel, internal, hydraulic.

SPECIAL NOTATIONS

AMERICAN-LA FRANCE

*Chief model also available as 2½-ton model, 34x7 tire, dual rear, weight 6,400. Price $3,900.

Chieftain model also available as Dump Truck, 160-inch wheel base.

Balloon tires optional on Chief, Chieftain and Big Chief models.

AUTOCAR

*Engines in these models are located under the driver's seat.

BROCKWAY

*Six wheelers.

CHEVROLET

Utility model available on 131-inch wheel base with chassis weight of 2,760 pounds and equipped with dual rear wheels.

DAY ELDER

*Six wheeler.

Additional standard wheel bases are available on different models as follows:—

85	156, 168	240	204
110	168, 186	285	204
130	165, 180, 204	345	204
160	165, 180, 204	402	204

DODGE

*Models F40, F41, F61 and F62 can be had with double drop frame.

DIAMOND T

*Six wheelers.

Additional standard wheel bases available as follows:—

551	158	750	167, 192
504	166½	801	180½, 193¾
506	174	1200	174½, 180
603	157, 170	1600	174½, 180
606	177½	1601	184

F. W. D.

*Indicates six-wheel model.

The BTL and BT models are special line construction trucks in which complete provision for mounting AT and T earth boring machine, winch, body and other line construction accessories is included in the standard chassis.

Special power take-off transmission, which provides 3 power take-offs which may be operated in any transmission speed, optional on all models.

FEDERAL

*Six wheelers.

GRAMM

Series	Straight Rating	Wheel Base	Pay Load Range
AX 4	8,000	157	1 to 1½ tons
AX 6	8,000	157	1 to 1½ tons
BX 4	10,000	157	1½ to 2 tons
BX 6	10,000	157	1½ to 2 tons
CX 4	12,000	157-180	2 to 3 tons
CX 6	12,000	157-180	2 to 3 tons
B	12,000	157-174	1¾ to 2½ tons
C	14,000	145-196	2 to 3 tons
D	17,000	145-196	2½ to 4 tons
E	20,000	145-196	3 to 4½ tons
EY			3 to 4 tons
GY			4 to 5 tons
GW	28,000	157-240	5 to 7½ tons
HY			5 to 6½ tons

†Both the four and six cylinder are also offered in 157-inch wheel base at $1,145 and $1,345, respectively.

GENERAL MOTORS TRUCK

*Capacity indicated is the Straight Rating (combined weight of chassis, body, equipment and payload) for which each chassis is designed and guaranteed to satisfactorily operate under average conditions. The size of the tires used does not affect this Straight Rating, but to secure maximum tire mileage it is suggested that the total gross weight be limited to a "recommended gross weight" for each tire equipment based on tire capacity. Prices cover base chassis and vary with wheel base and tire combinations. The number of wheel base lengths, tire types, range of "recommended gross weights" and resulting payload range (assuming nominal body allowance) for each model follows:—

Note: Models T-15 to T-60, inclusive, are available for export only as coach chassis.

Model	Wheel Bases	Tire Types	Range of "Rec. Gross Weights"	Payload Range
T-11	1	1	3800	½
T-15	3	10	4500- 6500	½-1½
T-17	2	8	5500- 6500	1-1½
T-19	3	22	6500- 8500	1½-2
T-25	3	17	6800- 9000	1½-2
T-26	4	..	8500-11000	2-3
T-39	3	15	10000-12500	2-3
T-31	4	..	11000-14000	2½-4
T-42	4	12	12000-15000	2½-4
T-44	4	13	12000-16000	3-4½
T-51	4	..	16500-19000	4-5½
T-55	4	..	16500-19000	4-5½
T-60	4	18	18500-22000	5-6½
T-61	4	..	19500-22000	5-6½
T-82	4	12	19000-24000	5-7
T-85	3	..	22000-26000	5-7
T-90	3	7	22000-28000	5-7½
T-95	3	..	22000-34000	7-9
T-96	3	..	28000-34000	7-9

†Models T-90, T-95 and T-96 are six wheelers, the latter having one driven and one trailing axle. Optional rear axle gear ratios available for all models.

Double reduction axles available for Models T-60, T-61 and T-82.

INDIANA

*Six wheelers.

MACK

Other wheel bases furnished on all truck models.

On 6-wheel jobs, 4 rear wheels driven by chains, foot brake on 4 rear wheels.

††Made also in tractor models.

PAIGE

*Price includes panel or screen body.

PIERCE-ARROW

*Optional final drive on Models PW, PX, PY and PZ.

REO

Model 15 Junior can be had with 4-speed transmission at additional cost. Models 15 Junior, DF 129, DF, FA, FE and FF are available with dual wheels at additional cost.

SELDEN

Additional standard wheel bases are available on different models as follows:—

Model 37C	162 and 181
39C	177 and 190½
47CB, 47CD	151, 164 and 184
67C	151, 164, 184 and 198

STEWART

Models 30 and 30X can also be supplied in 110, 120 and 140-inch wheel base.

Models 40 and 40X can also be supplied in 110, 140 and 160-inch wheel base.

*Model 34X can be supplied in 135, 145, 160 and 176-inch wheel base.

Model 28X can be supplied in 130, 145, 160 and 176-inch wheel base.

Model 29XS can be supplied in 135, 160 and 176-inch wheel base.

*Models 18X, 32X and 36X can be supplied in 148, 190 and 220-inch wheel base.

*Models 19X, 31X and 27X can be supplied in 148, 172, 190, 220 and 235-inch wheel base.

As optional equipment models 18X, 19X, 36X, 31X and 27X can be supplied with Timken dual reduction rear axle.

Models 38-8 and 38-6 can be supplied in 196, 226 and 241-inch wheel base and worm axle.

STUDEBAKER

*Capacity model GN-N is 4,000 pounds for body, cab, driver and payload.

Maximum gross load, chassis, body and payload for Models 77 and 88 is 12,500 lbs. and for Model 99 is 14,000 lbs.

‡Hand brake same as foot brake, standard. Hand brake on drive shaft, special equipment.

WHITE

*Six wheelers.

**Price on Model 60K includes body.

VALLEY SHEET STEEL OUTPUT SWINGS UP TO MARCH LEVEL

Youngstown, O., May 14.—Approximately 800 men returned to work this week at the Falcon plant of the Empire Steel Corporation, one of the larger independent manufacturers of sheets, of which a large part go to the automobile manufacturing industry.

The Falcon plant had been idle six weeks as a result of slackness in demands for the company's products. Waddell and Thomas plants of Empire Steel also were idle. These plants will be started when buying volume justifies their operation.

As a result of the incre

Production--Engineering--Factory

Motor Vehicle Wheels

By ARTHUR B. DOMNOSKE
Executive Head, Mechanical Engineering Department, Stanford University, California

The following, in part, is the second and concluding installment of a paper presented before the Society of Automotive Engineers, San Fransisco, Cal.:

Metallurgical

As a non-metallurgist, I believe the determination of the general structure as to grain size and amount and general distribution of the non-metallic inclusions to be most important. Steel in which the grain size is too small is apt to buckle in forming, while too large a grain size may indicate a tendency toward brittleness. However, steel with coarse grains is not always brittle.

Tests on Completed Wheels

The finished wheel should be inspected for visible flaws, for correctness of rim dimensions, concentricity of rim and hub shell flange and for rim wobble.

A reasonable number should be taken from the production line and tested to destruction. Following are some of the possible tests:

Static

Radial compression with load applied at the axle (Fig. 4), and with wheel supported by block at rim. By measuring rim deflections an idea can be obtained of the resiliency of the wheel as a whole. This test is generally unnecessary for routine purposes, as the wheel is usually strong enough for radial loads. Transverse tensile load at hub and with wheel uniformly supported at the rim. This test shows the lateral rigidity of the rim and is the best static method for production (Fig. 5). Scid forces may be simulated by rigidly clamping the hub and applying a load at the rim.

Torque Fatigue

This test consists of clamping the hub or rim and applying a known torsional oscillation, in the plane of the wheel, to the other. For wire and wood wheels this test appears to be the most indicative of road performance.

Transverse Fatigue

The rim may be clamped to rotating table and a side load applied to a shaft mounted in the hub so as to cause reversals of bending stress. This test is particularly valuable in the disc wheel, where transverse deflections are the most troublesome.

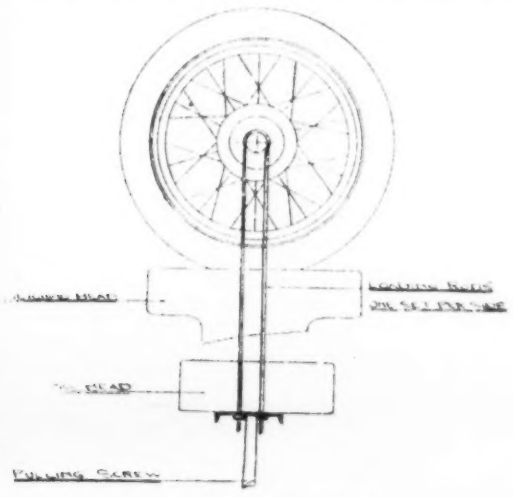


Fig. 4. Radial compression

Road Tests

Each new type of construction, whether it be in design, material or production process, must be given road tests before the wheel is offered to the public. The final and most severe tester of equipment is the purchaser. Designers can learn much by actual contact with an observing service man. Injured parts whose history is unknown are often misleading instead of helpful.

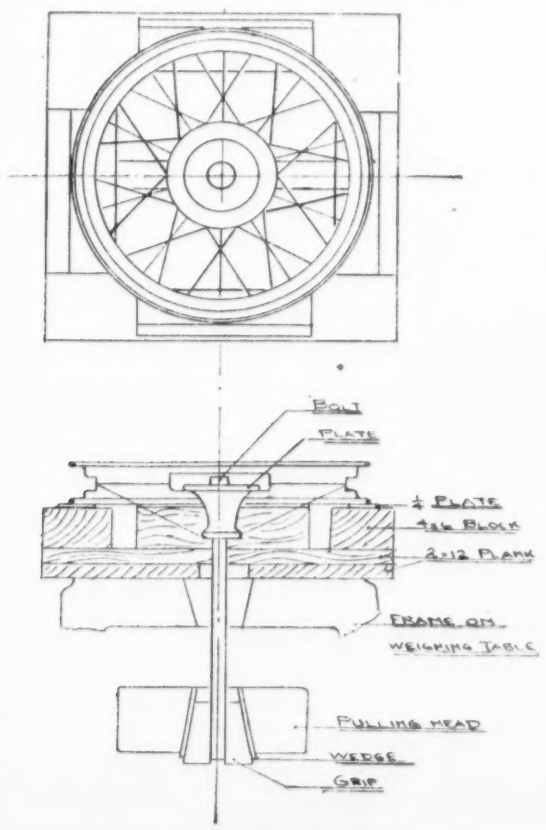


Fig. 5. Transverse tensile load

Wheel Trends

Wood wheels give a pleasing appearance of strength on passenger cars, and probably will continue to be generally used until the cost of production greatly exceeds that of other methods. For buses and trucks metal wheels have almost forced the wooden wheel off the road. This is largely due to shrinkage, for, as the weight of the vehicle is increased, spokes must be made larger, which results in a greater total contraction or expansion with change in humidity. Spokes are, therefore, harder to keep tight at the hub and less able to care for driving torque, braking and skid loads.

Wire wheels have been greatly improved in material and design. They are almost universally used in England on passenger cars, and seem quite popular in this country, even with a cost greater than the wood wheel. The heated argument of welding versus riveting may extend to the wheel field, as at least one company is building a wheel with tension spokes upset and riveted at the rim. Ford Motor Company welds their spokes at rim and hub shell.

At the present time the disc wheel seems out of the picture for passenger car service. It is satisfactory on buses, probably on account of the ease with which it may be designed to carry heavy vertical and torsional loads and because of the possibility of shortening axles.

Metal wheels, either of cast or pressed construction, are universally used on trucks. The spoked wheels are said to be cheaper than the disc for dual tires, to provide air space for ventilation, and it is easier to apply chains to the rim. Because of the heat energy dissipated in braking, the inboard tire is subjected to high temperatures at best, so any air circulation through the wheel is an asset.

Aluminum wheels are used in this country, but not to the extent that they are in Europe. The London Omnibus Company used some in 1924 and claimed as advantages one-half the weight of ordinary wheels and a scrap value of two-thirds the original casting cost.

The Aluminum Company of America thinks that even the wire wheel can be successfully made by aluminum by developing suitable means of fastening the spokes. Disk and spoked type wheels have been designed for passenger cars, but at present the cost is higher than wooden wheels.

Some wheel manufacturers consider the low elastic limit of aluminum a detriment.

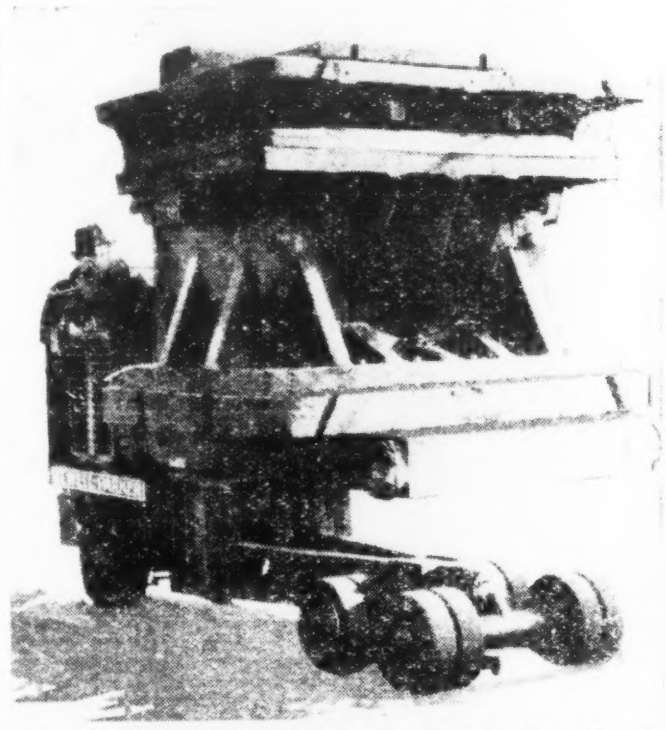
At some future day wheel design may not trouble us; with the increase in size of hub and brake drum and with decreased outer diameter of tires, we may simply mount the tire on the brake drum.

NEXT N. Y. MEETING S. A. E. TO BE HELD ON SHIPBOARD

The next meeting of the Metropolitan section, Society of Automotive Engineers, will be held aboard the steamship Paris, Pier 57, North River, West 15th Street. It will be preceded by an inspection of the Diesel motor ship Lafayette from 5 to 6.30 p. m., at the same location, and a dinner aboard the Paris at 6.30. A paper, "Diesel Engines," by F. Van Rossen Hoogendyk, will be presented at the meeting. The ladies are invited.

A beach party has been arranged at Fort Hancock for Saturday afternoon, June 6. Swimming, fishing, a shore dinner, dancing, etc., and a special showing of modern army transport in action are included in the program. The members are invited to bring their families and friends. The Sandy Hook steamer leaves Pier 10, Cedar Street, at 1.30 p. m., and Central New Jersey special train leaves Sandy Hook about 8 p. m.

Elwell-Parker Introduces 15-Ton Gasoline Electric Cantilever Tiering Truck



ELWELL-PARKER gasoline-electric tiering truck handling 15-ton die

A recent addition to equipment designed for the handling of heavy loads is the fifteen-ton gas-electric tiering truck introduced by the Elwell-Parker Electric Company, Cleveland, O. It is particularly adapted for the handling of large dies, such as are used in the manufacture of automobile bodies, and is shown in the accompanying illustration transporting one of these dies.

This truck weighs approximately 13,000 pounds, and, in this instance, is powered by a gas-electric unit which delivers electric power through an interlocked control system to the huge electric motor which drives the large wheels. One man operates the machine, which is steered by all six of the rubber-tired wheels by means of a twenty-inch hand wheel.

The drive wheel tires are 22 inches by 6 inches, while each front wheel carries two 15-inch by 5-inch solid rubber tires. All wheels are mounted on automobile type alloy steel knuckles set on the tire center line. The front axle also accommodates its wheels to the uneven runway as it is pivoted on a large forged alloy steel pin block bolted between the ends of the two rolled heavy bar centersills running back to the truck main frame.

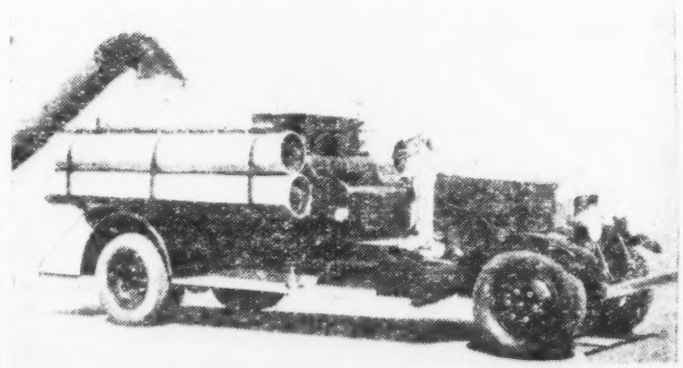
The cantilever type platform is built up of heavy structural and bent plate members. The entire weight is carried on two enormous "L" shaped steel arms provided with two rollers each which travel up and down the vertical members of the frame.

Raising of the load platform is accomplished by means of an electric winch mounted between the power plant and the uprights with control apparatus immediately in front of the operator, who can adjust the height by winding in the multiple cables on the power winch which is automatically controlled by an upper and lower limit switch, as set.

The electric winch performs a dual function. In addition to elevating the load, its motor drives a secondary countershaft fitted at either end with a cable drum set outside the edge of the load platform. The cables from these two drums, one on either side, are led down under sheaves on the level with, but at the rear of the platform, then led forward and passed around the sheaves shown on the side near the forward end of the platform. From here the cable hook is carried back alongside the platform beneath the overhanging die and attached to the other. It is only necessary for the operator to move his controller through the speed positions to wind in the cables and the die moves toward the front end of the platform and slides onto the press platen.

To remove the die from the press the two winch cable hooks are attached directly to the near side of the die to drag it onto the truck platform.

Pirsch Smoke Ejector



A new piece of fire fighting equipment has just been developed by Peter Pirsch & Sons, Kenosha, Wis. It is called a smoke ejector and its effectiveness is in its ability to draw smoke, gas and fumes from burning buildings. The equipment is operated by Continental Motor Corporation engines.

Three Dealers Express Opinions

J. M. Hull of Monmouth, Ill.

"Have been a reader for 4 years, two as Hull Motor Co., and two as President Monmouth Motor Sales, and feel your paper as necessary as shop equipment. More power to you."

Hull Motor Co.,
Monmouth, Ill.
J. M. Hull.

D. S. Miller of Canton, O.

"We are regular readers of the Automotive Daily News, and we think it is a very good paper."

Miller Auto Sales,
Canton, Ohio.
D. S. Miller.

Leitenberger of Johnstown, Pa.

"We have been a subscriber to the Automotive Daily News since it was first published and look forward to its daily arrival for the latest news in the automobile field, which it covers better than any news we receive.

"We also feel that any news we see in the paper including advertising, we can rely on as correct."

Leitenberger Machine Co.,
Johnstown, Pa.,
C. W. Leitenberger.

The opinions above from three passenger car dealers are representative of thousands. Mr. Hull says Automotive Daily News is as necessary as his shop equipment; Mr. Leitenberger knows he can rely on the news and advertising being correct.

Thousands of automotive dealers who read this publication daily, constitute an influential group in this country. An average of nearly seven persons in each dealer establishment reads Automotive Daily News every day and in automotive factories there are upwards of 9,000 readers.

Published daily, factory officials and dealers are served with news and features, while the material is still of business value to them. As a result the reader interest of this publication is very high.

Advertisers benefit by this reader interest and also by the fact that all advertising copy is easily seen.

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